Public Opinion Poll Survey

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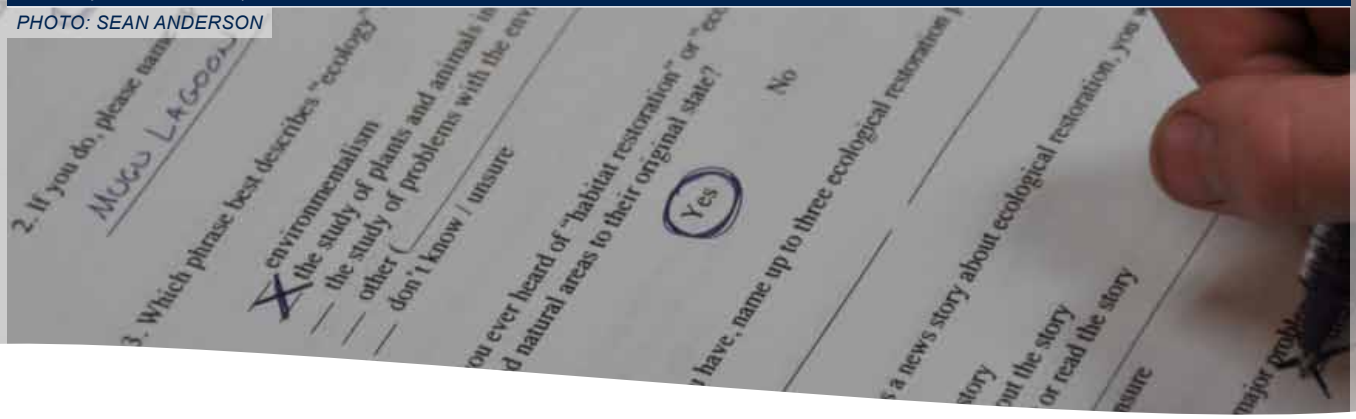


Public Perceptions of Coastal Resources in Southern California

SEAN ANDERSON

Abstract

Fostering a healthy coastal zone is arguably one of the most difficult challenges faced by the modern resource manager. California is at the epicenter of the long-term global trend of evermore-populous coastal strands with increasingly disparate and complex resource demands and development pressures. In such a situation, understanding the public's perceptions of various resources is key to shaping effective policy, conducting truly community-based conservation efforts, and effectively targeting scarce public dollars. Annual sampling of such public perceptions provides a better understanding of where the public currently stands on various issues and provides a long-term baseline with which to compare the efficacy of various future management efforts.

The coastal zone exerts a disproportional pull on almost every aspect of society; more than 50% of humans now reside within 50 km of the sea (Hinrichsen 1998), and that proportion is growing each year. Only 8% of the counties in the United States abut a coastline, but these coastal counties now account for nearly half of the U.S. population (U.S. Census Bureau 2011), including seven of the ten most populous counties (Wilson and Fischetti 2010). The five coastal counties of the Southern California Bight—Santa Barbara, Ventura, Los Angeles, Orange, and San Diego—comprise 0.4% of the area of the United States, but hosted 5.6% of this nation's population and 7.4% of its gross domestic product in 2008 (Pacheco and Ache 2011). Statewide, one component of the coastal zone—the beach—generated $61 billion a year (2001 dollars, California Department of Boating and Waterways and Conservancy 2002), with beach recreation worth an estimated $8.3 billion to the state and $5.5 billion to the rest of the United States annually (King and Symes 2003). Approximately two-thirds of California residents visit the beach annually (Public Policy Institute of California 2003) with an estimated 129 million visits per year made to Southern California beaches alone (Dwight et al. 2007) (Figure 1).

Despite the popularity and importance of the coastal zone, coastal zone management has generally proceeded in a relatively traditional manner wherein public agents primarily engage with motivated special interest groups such as environmental groups or developers The public has historically participated in management debates in California (e.g., Proposition 20 birthed the California Coastal Act of 1976, post-oil spill moratoriums on new offshore oil drilling leases); however, recent broad-base activism and engagement are increasingly the exception rather than the norm. Often current public engagement comes during extremely contentious or high-profile debates (e.g., proposed offshore liquefied natural gas terminals, celebrity home development in the coastal zone, desalination plant construction). An increasing body of scholarship (under the auspices of organizations such as the National Ocean Economics Program and the Santa Monica Bay Restoration Project) has begun to elucidate some underlying public perceptions of California coastal resources, generally focusing upon valuation of coastal strand recreation/human

Figure 1. Populated Coast in Manhattan Beach

PHOTO: SARAH WOODARD

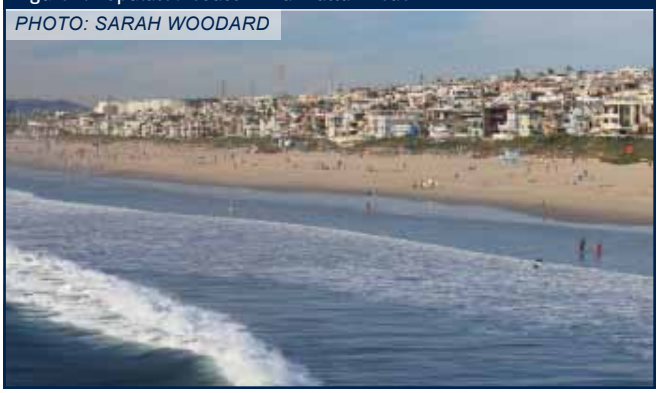


Figure 2. Slurry Lines for Beach Nourishment to McGrath State Beach

health to date. Having an ongoing tool with which to sample the public's opinion about their understanding of the coastal zone and their impressions of the management actions taken to date could augment this emerging socio-economic understanding and improve management efforts. To be of maximal utility to managers, such a tool should be continuous, broad-based, and not driven by any particular controversial issue.

Few efforts to understand public attitudes toward multiple coastal zone resources have been undertaken in recent years. Typically, these have been on a national scale (e.g., National Oceanic and Atmospheric Administration 2003) and so lack sufficient granularity to understand local attitudes or have been too narrowly focused on a particular topic (e.g., Natural Resources Defence Council 2010) to be broadly useful. Recent attempts to examine regional trends can provide sufficient detail/data for county/local analyses, but tend to focus on short-term economic valuation of a single particular coastal-dependent activity (e.g., Bell, Bonn, and Leeworthy 1998) and generally fail to sample all user groups (particularly non-consumptive resource users) or residents (National Oceanic and Atmospheric Administration 2003) or fully assess more indirect impacts/externalities. Examples of such sampling in Los Angeles County (Pendleton, Martin, and Webster 2001) have shown something of a disconnect between the objective assessment of coastal resource states and the generally negative public assessment of those resources. Such focused efforts tend to work well for justifying a given management action or decision (e.g., beach nourishment; Figure 2) but are of limited value when attempting to understand broader attitudes of the public as a whole to the coastal zone overall. A welcome exception to this trend is the emerging efforts of the California Coast Online Survey. Although the survey is still in development, major strides in gathering such an explicit, regional, longitudinal understanding of coastal zone user behavior (but apparently not views of given management actions) via web-based polling is currently under way (see Pendleton and LaFranchi 2009).

The California State University Channel Islands (CSUCI) Survey of Public Opinion of Coastal Resources represents an initial effort to quantify the public's understanding of and attitude toward various coastal resources and issues within coastal Southern California. This tool seeks to test the hypotheses that the general public:

1. Understands the current condition of coastal resources.
2. Frequently consumes or actively engages coastal resources.
3. Is aware of current coastal management efforts.
4. Is satisfied with current management efforts.

Methods

Opinion Polling Overview

Since 2005, students enrolled in CSUCI's Coastal and Marine Management (ESRM 462) class have conducted an annual CSUCI Survey of Public Opinion of Coastal Resources across southern Santa Barbara, Ventura, and northern Los Angeles counties in early fall (September through October). The results from each year's survey are incorporated into the course and provide various points of departure for discussions revolving around coastal management. This survey was originally not intended for use outside CSUCI classrooms. However, after repeated requests from various coastal managers for summaries of the polling data, annual sampling (from 144 surveys in 2005 to 1,486 in 2010) and scope of questioning were greatly expanded after the 2007 survey (Table 1).

Survey respondents were volunteers haphazardly encountered in public places (malls, parks, etc.) during daylight hours and not compensated. Owing to the location of the CSUCI campus, approximately 60% of the surveys were conducted within Ventura County, with the remainder split roughly equally between Santa Barbara and Los Angeles counties. Within any given location, sampling was haphazard (Connaway and Powell 2010). No more than 25 surveys were conducted within any one location in any given year to minimize any bias of this non-probability sampling (Fink 2003). Individual sampling locations were selected randomly from among publicly accessible areas (malls, parks, etc.) across the region. Question order was randomized for each survey in the first two years, but fixed for all subsequent surveys. All surveys used a printed questionnaire and were in English. A Spanish language version of this poll was piloted in 2010, but only data from the English language version are reported here.

Respondents covered a range of individuals whose composition differed somewhat from the overall coastal population

Table 1. Survey Overview

Year	# of Polls	Poll Version	# of Questions
Overall (2005-2010)	5,085	-	-
2005	144	3.2	24
2006	703	3.3	25
2007	494	4.2	27
2008	1,226	4.6	38
2009	1,032	4.7	39
2010	1,486	4.9	53

composition (within the five coastal county region). Survey participants were somewhat older (36±16, mean±1 standard deviation; median age = 31 vs. mean age 20–24; Pacheco and Ache 2011), more likely to have a college degree (37% vs. 29%; U.S. Census Bureau 2011), and vote regularly (76% vs. 42% of eligible voters voting in the 2010 elections; California Secretary of State 2011) relative to the local California population overall, but were otherwise similar in terms of income (most respondents' annual household income exceeded $60,000 vs. the median income bracket of $75,000–$99,999 in coastal populations; Pacheco and Ache 2011) and other metrics. Television and the Internet are equally dominant (both approximately 75% overall) as a source of news for survey participants.

Table 2. 2010 Poll Questions

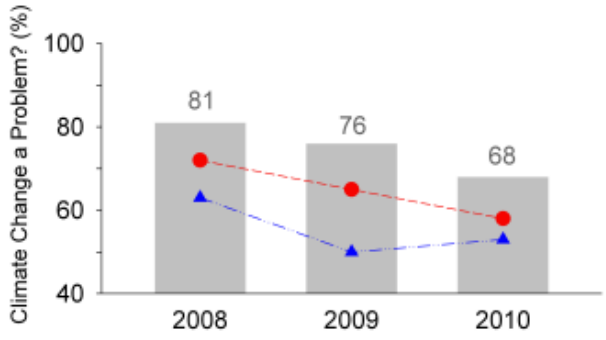
Category	# of Questions	Representative Question
Coastal Science	2	Which phrase best describes "ecology"?
Existing Conditions	8	If you believe wetlands have changed, by how much have they increased or decreased?
Management: Management Awareness	6	Which approaches to protect fish and shellfish populations are you familiar with?
Evaluation of Management	9	California is adequately managing our coastal and marine resources.
Desired Management	8	After the *Deepwater Horizon* oil spill, my attitude towards offshore oil and gas drilling:
Valuation	4	Would you favor spending the following amounts every year for the foreseeable future?
Behavior/Demographics	17	When was the last time you visited any of the California Channel Islands?

Figure 3. CSUCI Restoration Ecology Students in Ojai

PHOTO: SEAN ANDERSON

Figure 4. Climate Change Attitudes

IMAGE: SEAN ANDERSON



Climate Change attitudes. Borick et al. 2011 and Leiserowitz et al. 2011 data from national phone surveys.

Questions

A core of questions centering on ecological restoration and coastal wetlands have been asked each year, with additional questions added in subsequent years as various management issues have risen to the forefront (e.g., BP's *Deepwater Horizon* Oil Spill, wildfires in Malibu, Marine Protected Area implementation, etc.). As a result, the 2010 survey contains more than twice (53) the number of questions of the original 2005 survey (24; Table 1). This 2010 survey typically required 10–15 minutes to complete.

Questions fall into one of five broad categories (Table 2) that span public perception of science, awareness of the existing coastal conditions, perception of management efforts (which in turn is comprised of three distinct sub-categories), valuation of coastal resources, and personal behavior/demographics. Questions involving contingent valuation of resources require more sophisticated analyses and are not presented in this paper. Unless noted, data here are presented as the aggregation of all survey years. Most results are presented as the proportion of the total responses.

Rarely did responses vary much between survey years. When responses differed by more than 5% per year, data are reported by survey year.

Results

General Perceptions of Science and Nature

Most people (66%) identified ecology as the study of plants and animals in their environment and (72%) described the main motivation of scientists as primarily "seeking to objectively understand nature" (Figure 3). Additionally, most (>70%) respondents each year felt the ecological functioning of an area should be a primary (if not the primary) consideration for valuing natural areas. This is heartening given the increasing attention anti-science and anti-environment critiques have garnered in recent national debates about managing natural resources (e.g., Morello 2011).

In line with other national polls (Borick, Lachapelle, and Rabe 2011; Freedman 2011; Leiserowitz et al. 2011), this CSUCI survey has documented a steady erosion of concern surrounding climate change (Figure 4). Eighty-one percent of those sampled felt climate change was a major problem that needed to be dealt with

immediately when first asked about it in 2008. Concern eroded to only 68% feeling that way as of 2010. This may well be due to the politicization of the climate change issue (Morello 2011). Attitudes toward another traditionally controversial environment issue, endangered species, do not show such erosion of support in the coastal zone. Respondents who felt endangered species protections should be kept as is or strengthened have remained in the majority (fluctuating between 54% and 78%) with support peaking in 2010 (78%). However, willingness to use endangered species as a measure of the value of a given area has diminished roughly in line with the erosion of support for climate change since 2007.

Economic concerns have shifted to the forefront for most Americans during the economic upheaval of recent years. Interestingly, while this may have had an indirect effect upon people's attitudes toward climate change and other issues, only a fraction of people (<43%) have ever believed economic concerns should be used to determine the value of a given natural area, consistent with historic attitudes measured in California (Public Policy Institute of California 2003). Economic concerns are the only potential factor for valuing natural areas examined that has never achieved a plurality in the six years of this polling.

Activities in the Coastal Zone

Exercise and passive leisure activities dominated most people's coastal zone activities in the preceding six months. More than half of respondents recently ate, walked, played, and/or swam in the coastal zone (Figure 5). Roughly 40% of the sampled populations went to the coastal zone weekly (or more frequently) with nearly two-thirds going at least monthly. Multiplying aggregate reported natural area visitation frequency by the proportion of user-identified locations specifically in coastal areas finds 75% of the population visiting at least one coastal site per year. This is identical to the Southern California Bight coastal site visitation rate estimated by a Public Policy Institute of California (2003) poll before the onset of this survey sampling and similar to the 61% of Pendleton and LaFranchi (2009) during this polling study for beaches between Los Angeles and San Francisco. Relatively few (6–15%) respondents engage in activities requiring substantial equipment/capital investments or particular zoning (sailing, boating, diving, off-road vehicle driving, and horseback riding; Figure 6). Anglers, spearfishers, and hunters are scant (<16%) in the coastal zone, consistent with their long-term decline across the country as a whole (U.S. Fish and Wildlife Service and Bureau 2006).

When asked the last natural area visited, responders gave wide-ranging responses spanning Africa to the Americas. Nonetheless, locations within the Southern California Bight dominated (78%) the recent itineraries of those living here. The beach (61% of all responses) and coastal mountains (15%) were the most popular destinations. The most popular coastal locations within the Bight included Beaches within the City of Ventura (9% of coastal Bight responses), sites within the Santa Monica Mountains (6%),

Figure 5. Recreation at County Line Beach

PHOTO: SEAN ANDERSON

Figure 6. Recreational Diving

PHOTO: CHRIS STAFFIELD

Figure 7. Visiting Leo Carrillo State Beach

PHOTO: SEAN ANDERSON

Oxnard/Ormond Beaches (3%), Zuma/Point Dume Beaches (2%), sites within the Topatopa Mountains (2%), and Malibu Beach (2%). It is important to note here that this question of where people most recently visited is perhaps the most biased of this polling. As this sampling was clearly biased toward Ventura County and most people do not necessarily travel far to go on a hike or walk, it is not surprising that Ventura County destinations dominated specific responses. An additional confounding factor is the disproportionate number of coastal recreational sites available in Santa Barbara and Ventura counties relative to more urbanized stretches of the Bight. Traveling to either mountainous protected areas or public beaches to find relatively natural areas in which to recreate (Figure 7) is in part a simple consequence of the development/obliteration of most natural coastal plain areas, the channelization of creeks, and more across the Bight.

Figure 8. View of Anacapa Island from Santa Cruz Island

PHOTO: CHRIS STAFFIELD

Reflecting the logistical challenge of getting out to any of California's offshore Channel Islands, approximately one-third (34%) of the Southern California Bight population has never been to an island, and an additional third (33%) had not been to an island within the previous year. For those who have made the journey, island destination tracks closely with proximity to mainland harbors. More than half (53%) of visitors have been to Santa Catalina Island (directly out from the Los Angeles/Long Beach Harbor), followed by Anacapa (44%) and Santa Cruz (41%) just off the coast from Ventura, Channel Islands, and Port Hueneme Harbors (Figure 8).

Awareness of Existing Coastal Conditions

Most responders rank pollution (first) as the greatest threat to coastal areas generally (Figure 9), consistent with American perspectives on environmental threats historically (Markham 1994). Outright destruction/fragmentation (second) of areas and overharvesting (third) are secondary, and invasive species (fourth) are perceived as the least problematic. This carries into their perception of threats to specific coastal resources. Perceived threats to wetlands follow an identical pattern (although the magnitude of difference between rankings is somewhat less) and a very similar pattern for threats to California's fisheries. The palette of potential threats to fisheries was expanded to include ocean acidification and altered temperature, which are two climate change-related threats (Solomon et al. 2007). Again, pollution was identified as the greatest threat, followed by overharvesting, habitat destruction/fragmentation, acidification, temperature, and invasive species.

Coastal scientists do not have an absolute objective rubric to determine which threats pose the greatest risk to any one resource, let alone the coastal zone as a whole. Most managers and indeed members of the public understand multiple factors interact to produce coastal zone challenges. Indeed, pollution remains an ongoing challenge to managers (Dorfman and Rosselot 2011) decades after the onset of the modern pollution control era (Figure 10). However, even a cursory examination of existing policy priorities (Ventura County Watershed Protection District 2005), funded management activities (Santa Monica Bay Restoration Commission n.d.), and academic research (Hunt & Associates 2008) shows that pollution is but one of various threats to coastal resources. Yet the perceived pollution primacy trumps even harvesting as the key factor believed to influence harvested fish stocks. Recently, declining budgets have limited beach access (the most popular coastal destination) by park closures, but this comes in the wake of almost two decades of increasingly frequent sewage-driven beach

Figure 9.Perceived Resource Threat

IMAGE: SEAN ANDERSON

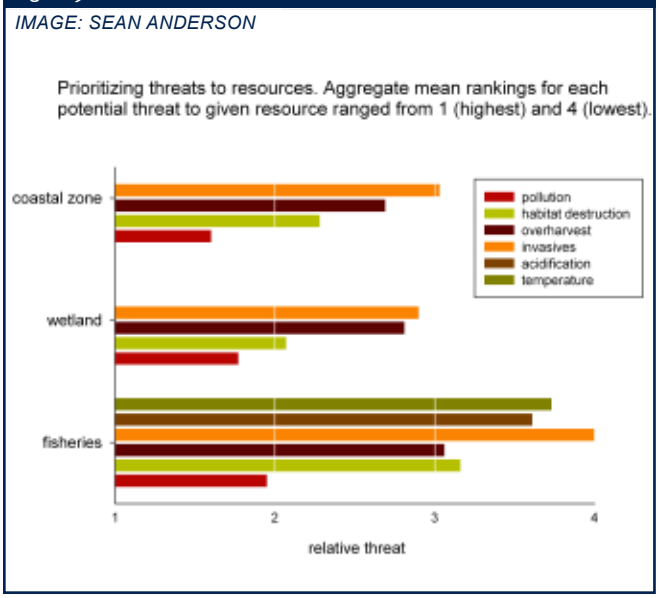


Figure 10.Superfund Site Sign

PHOTO: SEAN ANDERSON

Figure 11. No Swimming Sign

PHOTO: SEAN ANDERSON

closures/swimming advisories across the Bight that have limited access and harmed beach-related tourism, particularly in Orange County (Barboza 2010). These chronic closures have likely amplified the perceived threat of pollution to the coast generally (Figure 11). De-emphasis of threat categories in the public's eye ultimately influences management via underfunding and/or deprioritization (Cohen, March, and Olsen 1972). Deprioritization of invaders has been seen most recently in the elimination of the division within California Department of Fish and Game responsible for invasive plant control. The need for researchers and managers to adequately communicate the plethora of threats facing the coastal zone will only grow in this emerging era of reduced budgets and management scope.

Most people are unfamiliar with the public agencies principally responsible for managing resources in the coastal zone. Most people are familiar with the U.S. Coast Guard (85%), California Coastal Commission (66%), and California Coastal Conservancy (51%). Forty-two percent have heard of the U.S. National Oceanic and Atmospheric Administration. Other agencies are familiar to less than a third of responders. Awareness of these less-known agencies seems somewhat more correlated with news coverage. For example, awareness of California's Ocean Protection Council halved between 2009 and 2010 as the somewhat contentious multi-year Marine Protected Area planning process for the Bight ended.

Evaluation of Coastal Management

Only 17% of respondents feel that coastal and marine resources are adequately managed (Figure 12). The remainder are almost evenly split between those who feel managers are not adequately managing these resources (43%) and those who are unsure or do not know enough to make an informed opinion (40%). That nearly half the population cannot evaluate current coastal zone management is consistent with the general lack of awareness of the agencies responsible for doing so. When the management in question is specific enough and press coverage abundant, respondents are much more likely to express an opinion. For example, when asked about high-profile coastal disasters, Southern Californians believe essentially the same amount of rebuilding should occur no matter whether the event was fire in the Malibu Hills (41% want all or most rebuilt, 23% are unsure) or failed levees in New Orleans (44% want all or most rebuilt, 16% are unsure).

Independent of the public's evaluation of current management, they strongly believe (59%) that the ocean is less healthy now than 50 years ago (Figure 13). Only 12% believe ocean health has improved over that time. They feel similarly that marine fish stocks are less healthy now (55%) than 50 years ago. Further refinement of the CSUCI questionnaire is necessary to determine if respondents feel this has been a slow, consistent degradation or if local conditions had previously improved and then recently seemed to decline. Informal post-survey discussions with respondents suggest that at least some are basing their aggregate ocean health assessment primarily upon apparent contamination/water quality concerns.

Figure 12. Perceived Management Efforts

IMAGE: SEAN ANDERSON

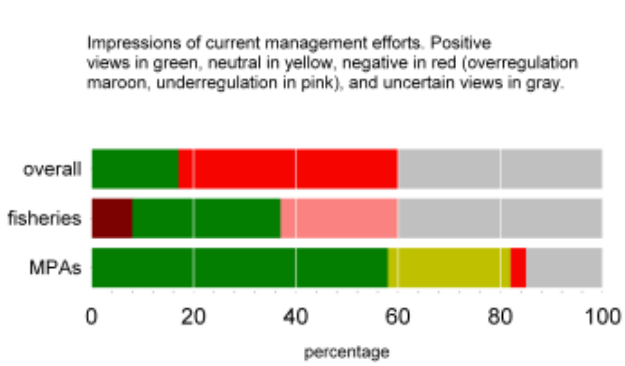
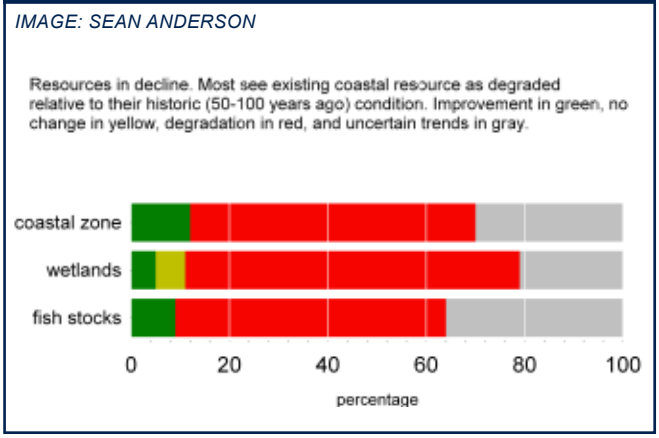


Figure 13. Perceived Resource Trends

IMAGE: SEAN ANDERSON



Long Grade Creek Restoration on CSUCI Campus

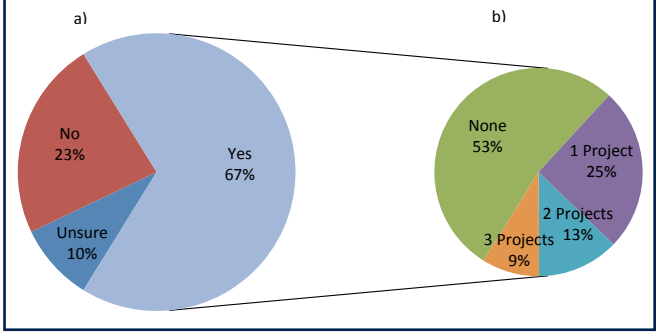
Focal Topic 1: Ecological Restoration in the Coastal Zone

Recovering and rehabilitating degraded ecological systems in the coastal zone are increasingly popular tools used to achieve multiple policy goals. Restoration is used throughout the Southern California Bight to recover subtidal reef communities degraded by power plants (Southern California Edison Company 2008), suppress non-native invasive species (Wildscape Restoration and Rincon Consultants 2011), boost populations of endangered species (U.S. Army Corps of Engineers 2003), improve water quality (Selkirk 2011), and increase recreational opportunities from surfing to biking to bird watching (Moffatt & Nichol 2005). All too often, however, the agencies and groups responsible for these restorations fail to adequately engage with the public or give them a deep sense of ownership or understanding of the value of such projects. For example, roughly two-thirds of respondents claim they would want to read/watch a news story about restoration efforts (63%) and claimed to have heard of ecological restoration (67%). However, when pressed, less than half (47%) of those claiming to know of such projects could actually name one anywhere on the planet (Figure 14). Aggregating across all survey years, only 17% of overall respondents correctly named a single restoration effort and 15% could name multiple restorations.

Figure 14. Aggregate Survey Responses

a) "Have you ever heard of 'ecological restoration' (returning damaged natural areas to their original state)?"

b) With limited success, those that responded "yes" were asked to correctly name up to three restoration projects.



A closer examination of restoration projects correctly identified by the public is illustrative of which projects have garnered the most public attention. Happily for local proponents of restoration, coastal restoration projects are by far the most readily identified (76%), whether or not they are located in the Southern California Bight. Two-thirds of the most frequent restorations identified outside the Bight are coastal projects (interestingly, one-third of these are clearly associated with a marine oil spill). Only efforts to recover the ecological functioning within Yosemite and Yellowstone National Parks are popular enough to vie with coastal restoration projects in the mind of the public.

As noted earlier, the overrepresentation of Ventura County canvassing locations has biased sampling to favor locations in and around Ventura County. In the case of restoration project identification, however, the bias is difficult to interpret since restoration projects are not evenly distributed across the Southern California Bight. A more even distribution of sampling effort across the Bight would surely have increased the representation of projects in Orange and San Diego counties. That said, Ventura County and the Santa Monica Mountains (Ventura and Los Angeles counties) currently house the greatest number of coastal restoration projects across the Bight, including many with very high local and even national profiles (Matilija Dam removal, Ormond Beach Wetlands, Malibu Lagoon, etc.).

Identified restoration projects in the Bight were dominated by coastal salt marsh and estuarine restoration efforts. Riparian projects were the next most described projects, followed distantly by efforts in other ecological communities. The notoriety of a given project does not necessarily seem to be tied to project size or expenditures to date. For example, Malibu Lagoon is one of the smallest coastal wetland restoration projects currently under way within the Bight but was the fifth most identified restoration. Although all of these popular projects have a substantial, associated price tag (tens to hundreds of millions of dollars), not all have expended that amount to date or depended primarily upon public funding. Similarly,

the second most popular location (Mugu Lagoon; Figure 15) is a military base that restricts access while two other identifiers are offshore islands, meaning direct use and ease of access are not necessarily good predictors. The single unifying factor for all these popular restoration projects is controversy. This can come from threats to

Figure 15. Mugu Lagoon Restoration

PHOTO: SEAN ANDERSON

ecological health (as with the Halaco Superfund dump overlying a large chunk of the Ormond Beach Wetland site; Figure 16), human health (as with the poor water quality currently in Malibu Lagoon that can sicken beachgoers), or recreational opportunities (as with Matilija Dam's erosion of coastal surfing spots across Ventura's coastline). That controversy, if managed properly, can ultimately lead to an engaged public who are deeply connected to the project, have a clear vested interest in seeing the project succeed, and even actively engage with planning, implementing, and monitoring the restoration (witness the efforts to restore the Bolsa Chica Wetlands).

Figure 16. Halaco Superfund Dump

PHOTO: SEAN ANDERSON

Crab Burrows at Carpinteria Salt Marsh

PHOTO: SEAN ANDERSON

Focal Topic 2: Wetlands in the Coastal Zone

Wetlands are interesting ecological communities from ecological and policy perspectives. Often described as "not" systems because they are neither fully terrestrial nor fully aquatic systems, these transitional communities have historically been viewed as areas of little value and their destruction often an explicit policy goal (Mitsch and Gosselink 2000). In recent decades, the importance of these systems has grown dramatically such that strong national, state, and local polices seek to conserve and expand these systems, 91% of which have been destroyed in California since the late 1800s (Dahl 1990).

Most respondents (68%) correctly described the fact that California wetlands have decreased over the past 150 years (Figure 13). However, the respondents' estimates of the magnitude of that change varied widely. The most popular (29% overall) estimate is somewhere between 25% and 48%. Only 11% of overall respondents correctly identified the magnitude of loss. This underestimate of loss may be related to the fact that most people feel pollution of wetlands ranks as their greatest threat (see above) rather than outright destruction of these systems. When asked what action the respondents would support to repair wetlands (if the majority were degraded), only once has any option ever garnered a plurality of support (52% favored using tax dollars in 2005). In aggregate, the most common

Figure 17. Aggregate Survey Responses

a) *"Do you know of any 'wetlands' within 50 miles of your home?"*

b) *With mostly success, those that responded "yes" were asked to correctly name up to three nearby wetlands / projects.*

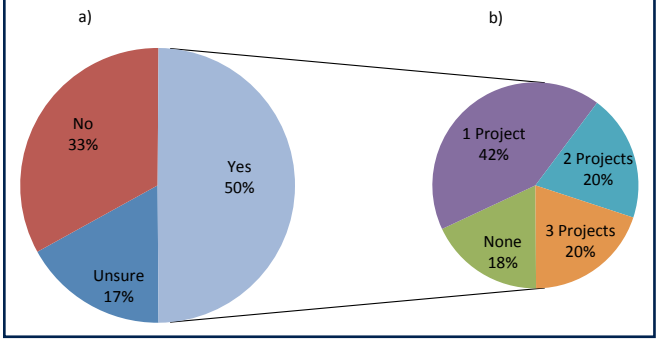
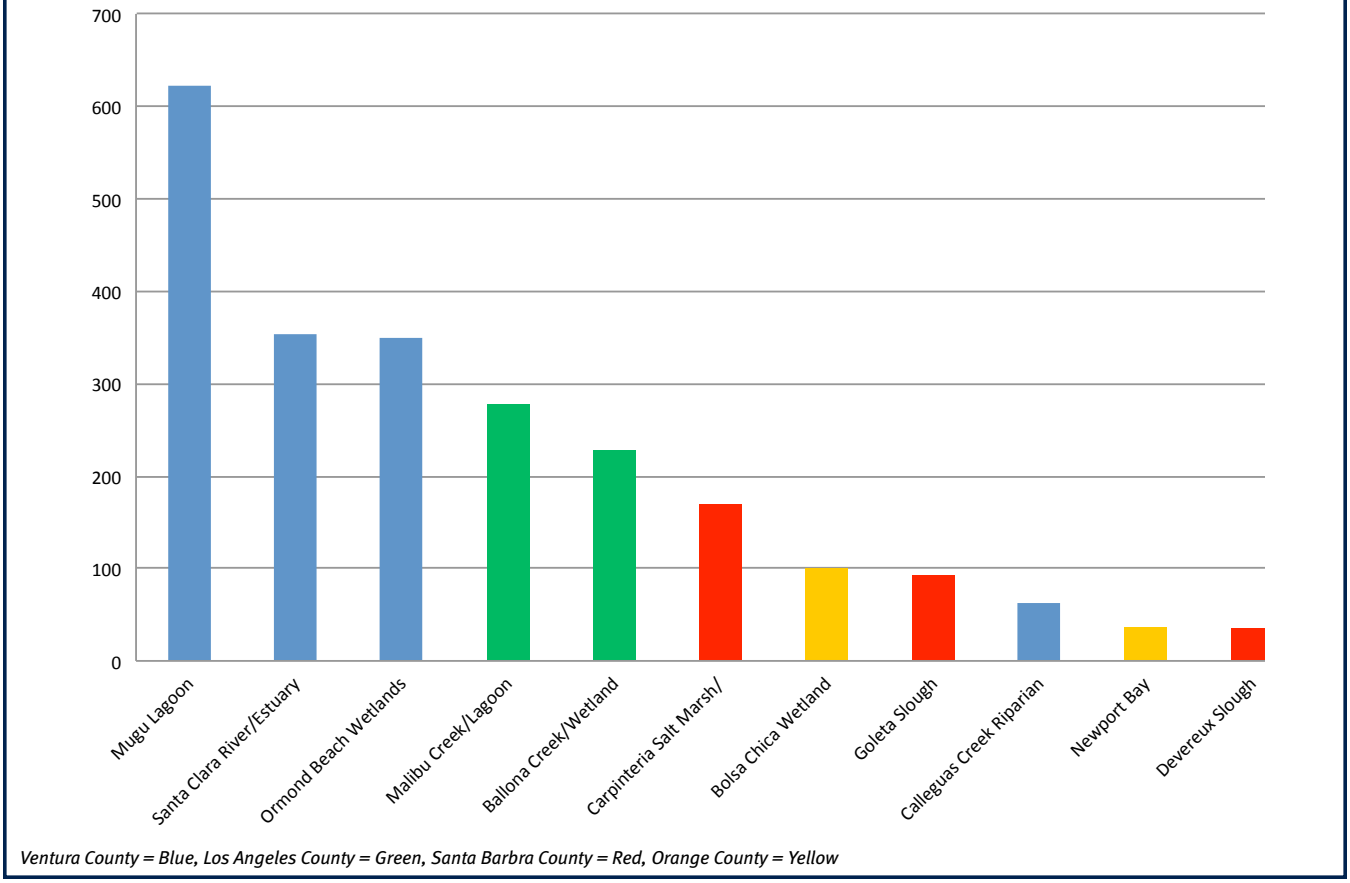


Figure 18. Mugu Lagoon

response was *unsure/I don't know*. The lack of support for contributing personal monies or supporting the public allocation of funds for such projects prior to the 2008 onset of the global financial crisis does not bode well for such efforts in this emerging era of economic austerity.

Wetland systems are widespread across Southern California, yet only half of respondents claimed they knew of a wetland within 50 miles of their home (Figures 17 & 18). Happily, when asked to be specific, many more respondents who said they knew of a local wetland could accurately name one or more wetlands (82%) than could name a restoration (47%). Nearly half (43%) of all people polled overall could correctly name a local wetland in the Southern California Bight; 22% could name a single wetland, and 21% could name multiple wetlands. Unlike the identification of restoration projects, the main factor in someone being able to name a wetland seems to simply be the size. There was a good deal of overlap between the most popular wetlands and restoration sites. Six of the top 11 identified wetlands also housed the most popular restoration projects: Mugu Lagoon (Ventura County), Santa Clara River/Estuary (Ventura County), Ormond Beach (Ventura County), Malibu Creek/Lagoon (Los Angeles County), Ballona Creek/Wetland (Los Angeles County), and Bolsa Chica Wetlands (Orange County) (Figure 19).

Figure 19. Aggregate Survey Responses: Most Identified Wetlands within Southern California



Ventura County = Blue, Los Angeles County = Green, Santa Barbra County = Red, Orange County = Yellow

Local Seafood Restaurant

PHOTO: SEAN ANDERSON

Focal Topic 3: Seafood Consumption

California historically had some of the most productive nearshore fisheries on the planet, but has experienced significant declines in commercial landings in recent decades owing to depressed fish stocks and more stringent fisheries management. Overall reduction in California commercial vessels (4,000 in 1982 to 2,700 in 1999 to 2,560 in 2011; California Department of Fish and Game 2011) correlated with Californian finfish and shellfish landings halving between 1970 and 1990 (Kildow and Colgan 2005), while overall U.S. landings more than doubled (driven principally by expanded Alaskan production and fish farming). The decline of locally sourced seafood and the local fishing industry can been seen by comparing the rankings of the most profitable fishing ports in the United States (National Ocean Economics Program 2011). In 1981, the Southern California Bight hosted the second (Los Angeles), third (San Diego), fifteenth (Port Hueneme/Oxnard/Ventura), and forty-ninth (Santa Barbara) most profitable commercial fishing ports in the United States by landed value. By 2007, those same ports had fallen to twenty-ninth (Los Angeles) and forty-second (Port Hueneme/Oxnard/Ventura) or dropped off national rankings all together by landing less than $1.5 million worth of fish each year (National Ocean Economics Program 2011).

With such a diminished fishing profile, it is no surprise an aggregate 36% of those polled felt unable to determine if marine fish stocks have improved or declined over the last half century, and an aggregate 40% felt unable to judge the adequacy of current fishing regulations (Figure 12). Most people had heard of size limits (75%) and seasonal closures (69%) to manage fisheries, but only a minority knew of gear limitation (35%) or Marine Protected Area (MPA, 38%) approaches. When asked separately if respondents knew of MPAs, 50% said they did. The discrepancy between the 38% and 50% may be ascribed to the inherent error of this survey tool or to the fact that one question simply asked if they had heard of MPAs (50%) while the other asked if they were familiar with MPAs for regulating fisheries (38%). In any event, the vast majority (58%) felt MPAs were positive, and very few (3%) felt MPAs were detrimental.

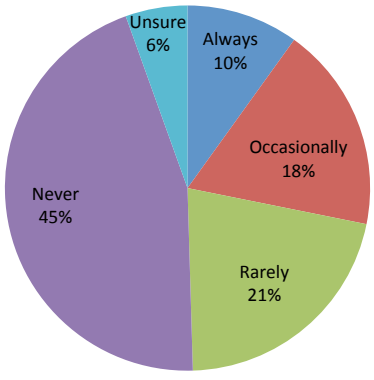
Seafood is popular here in Southern California (Figure 20). An aggregate 37% eat seafood weekly and 68% monthly. Seafood eaters consumed 5.4 ± 28.3 (mean ± 1 standard deviation) ounces of seafood in the week before the 2010 fall survey (the first year this question was asked). Few of these consumers see the need to be selective about the sourcing of their seafood; 45% never ask about its source when purchasing, and only 10% always or nearly always ask (Figure 21). It is, therefore, not surprising that few respondents (26%) had heard of so-called sustainable seafood. Most (74%) had heard of the Dolphin Safe label

Figure 20. California Fish Crates

PHOTO: SEAN ANDERSON

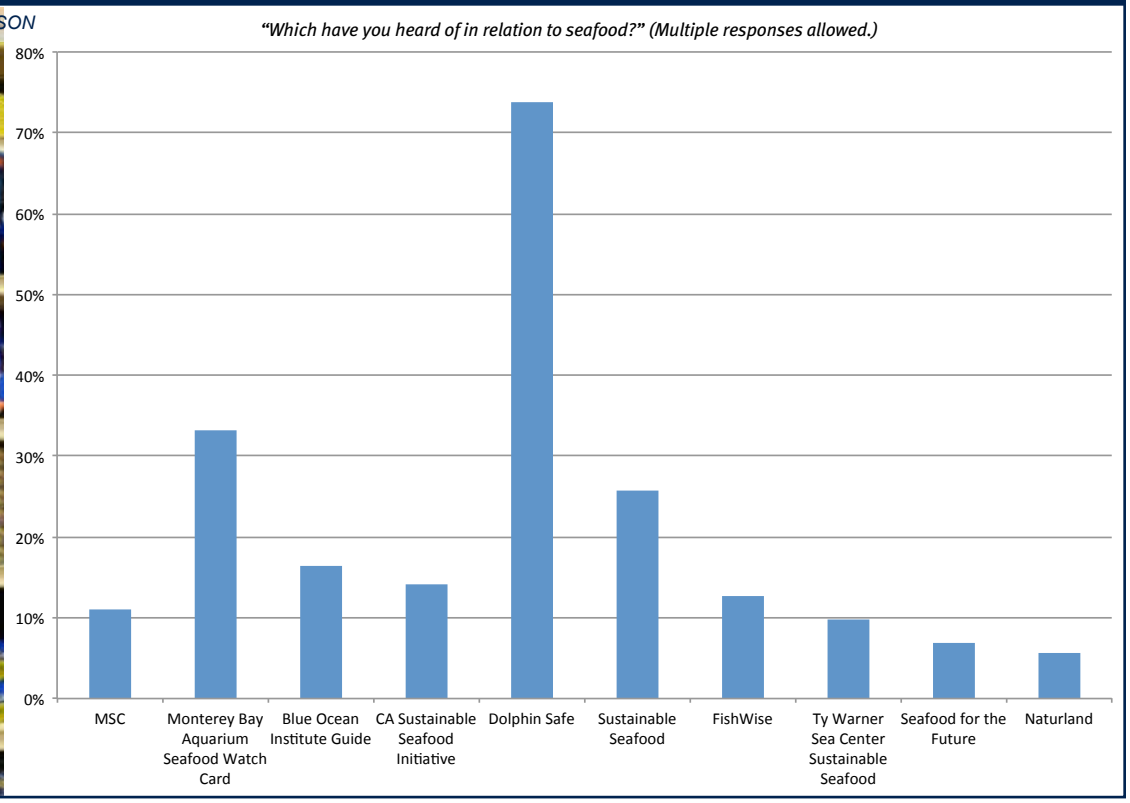
Figure 21. Aggregate Survey Responses

"When purchasing seafood, you ask where it comes from...?"



Figures 22 & 23. Canned Tuna at the Supermarket & Aggregate Survey Responses


PHOTO: SEAN ANDERSON



that is now ubiquitous on canned tuna (Figure 22), but no other ecolabel or seafood buying guide has achieved such penetration (Figure 23). The most popular seafood buying guide (the Monterey Bay Aquarium's Seafood Watch wallet card/smart phone app) was familiar to only one-third (33%) of respondents. The younger, regional seafood buying guides based out of Santa Barbara (Ty Warner Sea Center Sustainable Seafood program) and Long Beach (Seafood for the Future) were known to only 10% and 7% (respectively) of the public. The most famous third-party seafood certification organization, the Marine Stewardship Council, was known to only 11% of respondents despite being in the marketplace since 1999.

Yields from wild-caught fisheries are declining globally (UN Food and Agriculture Organization 2009) as the human population continues to grow. However, many consumers (49%) do not know what to make of farmed seafood. More feel farming should be reduced or eliminated (31%) than feel it should be expanded (21%). This finding appears to be a consequence of the negative press mariculture practices, particularly salmon farming, have garnered in recent years (e.g., Farmed Salmon Exposed 2008).

Conclusions

As with most such efforts to take the pulse of the general population, this ongoing effort shows a multifaceted populace. Southern Californians very much enjoy their coastal resources, engaging in consumptive and non-consumptive uses of them. The public is aware of many high-profile or contentious management efforts, but generally not the main entities or agencies engaged in that management. A robust and holistic understanding of the state of managed resources is lacking. Coastal resources are understood to have degraded over time, and most people are dissatisfied with the current trajectory of stewardship.

Although resource managers may find the lack of awareness of their various efforts disappointing, these data harbor a positive aspect. Restorations, wetlands, and recreation destinations are surprisingly well-known. Many people in coastal Southern California are not fully aware of the condition of their coast or the challenges stewards of those resources grapple with daily. This ignorance does not equate to hostility toward effective resource management, however. Indeed, when informed and included, this survey has illuminated a population largely supportive of effective management that bolsters the health of the coast. The challenge for all who work along urban coasts is to seize upon that existing and nascent support for effective management. Engaged citizens passionate enough to educate their fellow citizens and draw them into active management of these systems are out there.

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References

Barboza, Tony. 2010. "Major sewage spill could keep O.C. beaches closed through the weekend." The Los Angeles Times, March 26.

Bell, Frederick W., Mark A. Bonn, and Vernon R. Leeworthy. 1998. Economic Impact and Importance of Artificial Reefs In Bay County, Florida. Office of Fisheries Management and Assistance Service Florida Department of Environmental Protection.

Borick, Christopher P., Erick Lachapelle, and Barry G. Rabe. 2011. "Climate Compared: Public Opinion on Climate Change in the United States and Canada." Issues in Governance 39:1–13.

California Department of Boating and Waterways, and California State Coastal Conservancy. 2002. California Beach Restoration Study. Sacramento, CA.

California Department of Fish and Game. 2011. Commercial Fishing Licenses and Permits. California Department of Fish and Game.

California Secretary of State. 2011. Report of Voter Registration. California Secretary of State.

Cohen, Michael D., James G. March, and Johan P. Olsen. 1972. "A Garbage Can Model of Organizational Choice." Administrative Science Quarterly 17 (1):1–25.

Connaway, Lynn Silipigni, and Ronald R. Powell. 2010. Basic Library Research for Librarians, Fifth Edition. Santa Barbara, CA: Libraries Unlimited.

Dahl, T. E. 1990. Wetland Losses in the United States 1780's to 1980's. Washington, DC: U.S. Department of the Interior, Fish and Wildlife Service.

Dorfman, Mark, and Kirsten Sinclair Rosselot. 2011. Testing the Waters: A Guide to Water Quality at Vacation Beaches. Natural Resources Defence Council.

Dwight, Ryan H., Mitchell V. Brinks, Gajapathi Sharavana Kumar, and Jan C. Semenza. 2007. "Beach Attendance and Bathing Rates for Southern California Beaches." Ocean & Coastal Management 50: 847–858.

Farmed Salmon Exposed. 2008. The Problem. Farm Salmon Exposed. http://www.farmedsalmonexposed.org/theproblem_2008.html.

Fink, Arlene. 2003. The Survey Kit, 2nd ed. Thousand Oaks, CA: Sage.

Freedman, Andrew. 2011. "Public Remains Confused about Global Warming, but Less So." In Capital Weather Gang. Washington, DC: The Washington Post.

Hinrichsen, Don. 1998. Coastal Waters of the World: Trends, Threats, and Strategies. Washington, DC: Island Press.

Hunt & Associates. 2008. Southern California Steelhead Recovery Planning Area Conservation Action Planning (CAP) Workbooks Threat Assessment. Santa Barbara, CA: National Oceanic and Atmospheric Administration.

Kildow, Judith, and Charles S. Colgan. 2005. California's Ocean Economy. National Ocean Economics Program.

King, Philip, and Douglas Symes. 2003. The Potential Loss in Gross National Product and Gross State Product from a Failure to Maintain California's Beaches. Report to the California Department of Boating and Waterways.

Leiserowitz, A., E. Maibach, C. Roser-Renouf, N. Smith, and J. D. Hmielowski. 2011. Climate Change in the American Mind: Public Support for Climate & Energy Policies in November 2011. New Haven, CT: Yale Project on Climate Change Communication.

Markham, Adam. 1994. A Brief History of Pollution. New York: St. Martin's Press.

Mitsch, W. J., and J. G. Gosselink. 2000. Wetlands, 4th ed. New York: Wiley & Sons.

Moffatt & Nichol. 2005. Final Malibu Lagoon Restoration and Enhancement Plan. Long Beach, CA: California State Coastal Conservancy.

Morello, Lauren. 2011. "New Science Panel Chairman to Probe 'Quality' of Climate Science." The New York Times, January 6.

National Ocean Economics Program. 2011. Top Fishing Port Database. NOEP indexed and standardized NMFS database.

National Oceanic and Atmospheric Administration. 2003. Socioeconomic Research and Monitoring Recommendations for Marine Protected Areas in the Channel Islands National Marine Sanctuary. Silver Spring, MD: National Oceanic and Atmospheric Administration.

Natural Resources Defence Council. 2010. Gulf Coast Seafood Consumption Survey.

Pacheco, Percy A., and Brent Ache. 2011. Woods and Poole 1970-2040 Data Aggregate: Time Series Demographic Statistics Census Trends (1970-2000) Variables for 50 Miles Buffer from Coastline in the State, edited by W. a. P. E. Washington, DC: NOAA's Spatial Trends in Coastal Socioeconomics.

Pendleton, Linwood, Nicole Martin, and D. G. Webster. 2001. "Public Perceptions of Environmental Quality: A Survey Study of Beach Use and Perceptions in Los Angeles County." Marine Pollution Bulletin 42:1155–60.

Pendleton, Linwood, and Chris LaFranchi. 2009. The California Coast Online Survey: Southern California Module. Report to the Santa Monica Bay Restoration Foundation.

Public Policy Institute of California. 2003. Special Survey on Californians and the Environment. In PPIC Statewide Survey: November 2003. San Francisco: PPIC.

Santa Monica Bay Restoration Commission. n.d. Programs and Projects. Available from http://www.santamonicabay.org/smbay/ProgramsProjects/tabid/79/Default.aspx.

Selkirk, Mary. 2011. Matilija Dam Ecosystem Restoration Project Fine Sediment Study Group Final Report.

Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Mille, eds. 2007. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.

Southern California Edison. 2008. Coastal Development Plan for the SONGS Artificial Reef Mitigation: Adopted Findings and Conditions, edited by C. C. Commission. Ventura, California: California Coastal Commission.

United Nations Food and Agriculture Organization. 2009. The State of World Fisheries and Aquaculture 2008. Rome, Italy: United Nations.

U.S. Army Corps of Engineers. 2003. Mission Creek Section 206 Draft Preliminary Restoration Plan. Los Angeles, California: United States Army Corps of Engineers.

U.S. Census Bureau. 2011. Statistical Abstract of the United States. Washington, DC: U.S. Census Bureau.

U.S. Fish and Wildlife Service, and U.S. Census Bureau. 2006. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Washington, DC: U.S. Fish and Wildlife Service, and U.S. Census Bureau.

Ventura County Watershed Protection District. 2005. Integrated Watershed Protection Plan; Fiscal Year 2005 Zone 3. Ventura County, CA: Ventura County Watershed Protection District.

Wildscape Restoration, Inc., and Rincon Consultants. 2011. Calleguas Creek Watershed Arundo/Tamarisk Removal Program Environmental Impact Report. Somis, California: Ventura County Resource Conservation District.

Wilson, Steven C., and Thomas R. Fischetti. 2010. "Coastline Population Trends in the United States: 1960 to 2008 Population Estimates and Projections." In Current Population Reports. Washington, DC: U.S. Department of Commerce.