



**FISH CONTAMINATION EDUCATION COLLABORATIVE
FINAL ANNUAL ANGLER OUTREACH REPORT**

February 2015 – July 2016

Palos Verdes Shelf Superfund Site

Los Angeles County, California

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EXECUTIVE SUMMARY

The Palos Verdes Shelf Superfund site is Operable Unit 5 of the Montrose Chemical Corporation Superfund site, located in Los Angeles County, California. The Palos Verdes Shelf, a portion of the continental shelf off the coast of Los Angeles, became contaminated with dichloro-diphenyl-trichloroethane and polychlorinated biphenyls from the Montrose Chemical plant and other industries that discharged their waste into the Los Angeles County sanitation system. Today, several square miles of sediment on the continental shelf are contaminated with these legacy pollutants. Although the contaminated sediment is too deep for human contact, some fish in the area accumulate these organic pollutants at levels that make them unsafe for consumption. The U.S. Environmental Protection Agency's (EPA) initial response to the site was to focus on limiting consumption of these potentially contaminated fish. In February 2015, EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to re-establish the community involvement activities. In order to re-establish the activities, EA discussed the outreach previously conducted with EPA and the past contractor, reviewed the Interim Record of Decision (IROD) and Palos Verdes Shelf Superfund Site Institutional Controls (ICs) Program Implementation Plan, and contracted with past outreach community partners.

SUMMARY OF COMMUNITY INVOLVEMENT PROGRAM

The Community Involvement Program was designed to reduce risk exposure posed by contaminated fish through outreach and education. The program has three main activities: Angler Outreach, Community Outreach, and Enforcement. In support of these activities, EA coordinated meetings with the Fish Contamination Education Collaborative (FCEC). The FCEC is a forum for the agencies, outreach groups, and other entities involved to share ideas, get updates on the project's progress, and maintain momentum for continued outreach work. This report will discuss the outreach activities. The annual enforcement activities are documented in a separate report.

The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities. This report summarizes the extent of the outreach including:

1. Angler outreach conducted between March 2015 and July 2016
2. Bait shop outreach conducted in October/November 2015 and June 2016
3. Electronic outreach on the FCEC website and Facebook page conducted between January 2015 and July 2016
4. Community events attendance between April 2015 and June 2016.

EA subcontracted Heal the Bay (HTB) and Cabrillo Marine Aquarium (Cabrillo) to perform angler outreach; team subcontractor, HDR, Inc., to complete the bait shop outreach and attend community events; and Chinese Christian Herald Crusade and Boat People SOS to conduct outreach during community events for the Chinese and Vietnamese communities, respectively.

Electronic outreach through the FCEC website and Facebook page was maintained by EA. Three FCEC meetings were coordinated and facilitated by EA. Two FCEC partners meetings were held in April and November 2015. The third meeting will be held in July 2016.

Enforcement and pier sign monitoring activities were also performed as part of the Community Involvement Program. Enforcement activities were performed by the Department of Fish and Wildlife (recreational and commercial fishing) between January 2015 and January 2016. EA facilitated fish identification training workshops for the Los Angeles County and City of Long Beach inspectors in September 2015 and February 2016. The enforcement activities are further documented in the Annual Enforcement Report, prepared separately. The pier signs were routinely monitored by HTB and Cabrillo between February 2015 and July 2016 to assess the need for replacement or repair. Pier sign status including photos is summarized in a separate report.

PROGRAM EFFECTIVENESS

The Community Involvement Program, through the various outreach activities at multiple locations, has been effective in reaching anglers and community members to increase awareness of the contamination issues associated with the Palos Verdes Shelf Superfund Site. The angler outreach is effectively reaching anglers, more specifically, to white and English speaking/bi-lingual Hispanic communities, with a smaller minority of Chinese and Austronesian communities. Outreach conducted at 40 angler retail and bait shop locations in Huntington Beach, Seal Beach, Long Beach, San Pedro, Redondo Beach, Hermosa Beach, Manhattan Beach, Hawthorne, Marina Del Rey, Venice, and Santa Monica has also shown positive effectiveness in disseminating information. A total of 1,960 tip cards were distributed in English, Spanish, Vietnamese, and Chinese. During the most recent bait shop visits in June 2016, all of the targeted bait shops requested more materials for distribution. Of the outreach activities, electronic outreach has had the least effectiveness in reaching the communities based on the minimal traffic observed on the websites. The outreach reporting indicated that the community events were highly effective at reaching the target communities handing out approximately 10,630 total tip cards at events reaching Hispanic, African American, Vietnamese, and Chinese communities.

PROGRAM RECOMMENDATIONS

Although outreach has been effective at communicating the issues to the public, several observations and recommendations were made that could improve the program. For the angler outreach, both the contamination awareness and geographic distribution analyses could benefit from additional data collected during the outreach (e.g., media angler learned/became aware of contamination, if angler has shared his/her knowledge, city angler lives in) to be able to perform more in-depth sensitivity analyses and to better understand and visualize the geographic distribution of the anglers reached. In addition to tip cards and information brochures, other outreach materials (e.g., magnets and stickers with FCEC logo and “Do Not Consume” fish) were popular with pier anglers.

The bait shop outreach identified some big picture improvements that could benefit outreach. It was determined that phone and e-mail contact information of the outreach leads would benefit the bait shops and the public as a resource to ask questions or request information materials. During the bait shop visits, it was noted that many shops needed to replenish information materials sooner than every 3 to 6 months. Two bait shops in the San Pedro and Seal Beach areas requested Korean tip cards. It may be worth reevaluating the demographics in these communities to determine if tip cards should be provided in Korean. Another consideration for future bait shop outreach events includes targeting local fish markets, in addition to the bait shops, to distribute tip cards and further expand angler outreach.

Enhancements to the FCEC website and Facebook page content and activity could potentially improve the effectiveness of electronic outreach. Because the bounce rate for the FCEC website has remained above 80 percent since July 2015, it appears that users arrive to the website and leave because they cannot find what they are looking for. A reorganization of the content and/or a revision to the visual layout of the FCEC website homepage may enhance the ability for people to navigate and find specific links or additional pages they would like to visit. Enhancing the content on the Facebook page may also help increase visits to, likes, reach, and engagement of the Facebook page. This could involve posting more frequently about all the types of activities the FCEC is involved with, including changes to FCEC website, community events, and angler outreach events. The existing network could be leveraged by encouraging partner organizations to post, tag, and share content through their network. The more social media traffic generated through posts, as well as links back to the website, should improve the overall effectiveness of both the FCEC website and Facebook page.

Similar to the bait shop outreach, the community event outreach could benefit from broader improvements. Attending more community events would likely enhance outreach effectiveness and overall awareness of contamination issues at the Palos Verdes Shelf Superfund Site. Educational focused events seemed to attract larger and more diverse crowds of people, including educators and students, willing to learn about fish safety. Therefore, it was recommended to target events with an environmental and/or educational theme. Vietnamese angler outreach was not as effective as the other target groups. Many of the Vietnamese community events were health fairs; therefore, attendance of more diverse Vietnamese community events may be helpful in reaching this community.

The FCEC 'booth in the box' display should be updated for future community events. For instance, the large display board can be updated to include remediation and enforcement information as well as interactive displays. The large display board features outreach to fish markets and anglers; it would be worthwhile to add information for outreach to local educators, schools, and/or school districts to help attract teachers to the booth. Booth materials such as the broken fishing rods for the fishing game need replacement.

Another recommendation to improve the program includes distribution of more and a wider variety of information materials. Low-cost educational materials could include coloring book pages with crayons or other items that display the "Do Not Consume" fish and FCEC logo. It was also recommended to perform outreach to schools in the Los Angeles Unified School

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District for education of parents through children, using the curriculum available from the National Oceanic and Atmospheric Administration publications.

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ACRONYMS AND ABBREVIATIONS

BPSOS	Boat People SOS
Cabrillo	Cabrillo Marine Aquarium
CCHC	Chinese Christian Herald Crusade
EA	EA Engineering, Science, and Technology, Inc.
EPA	Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
HDR	HDR, Inc.
HTB	Heal the Bay
IC	institutional control
IROD	Interim Record of Decision

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1.0 INTRODUCTION

The Palos Verdes Shelf Superfund site is Operable Unit 5 of the Montrose Chemical Corporation Superfund site, located in Los Angeles County, California. The Palos Verdes Shelf, a portion of the continental shelf off the coast of Los Angeles, became contaminated with dichloro-diphenyl-trichloroethane and polychlorinated biphenyls from the Montrose Chemical plant and other industries that discharged their waste into the Los Angeles County sanitation system. Today, several square miles of sediment on the continental shelf are contaminated with these legacy pollutants. Although the contaminated sediment is too deep for human contact, some fish in the area accumulate these organic pollutants at levels that make them unsafe for consumption. The U.S. Environmental Protection Agency's (EPA) initial response to the site was to focus on limiting consumption of these potentially contaminated fish.

EPA signed an Action Memorandum for Institutional Controls (ICs) for the Palos Verdes Shelf in September 2001. "ICs" refers to non-engineered measures, such as site use restrictions, intended to prevent or reduce exposure to contaminants at a site. The Action Memorandum established ICs to reduce exposure to contaminated fish, particularly white croaker, from Palos Verdes Shelf. The program includes: (1) public education and outreach; (2) monitoring; and (3) enforcement. In 2003, EPA created the Fish Contamination Education Collaborative (FCEC) with representatives of federal, state and local agencies, and community-based organizations that carry out various outreach and education activities. Since then, each of these program facets has evolved and a fourth element—strategic planning—has been added to assess and calibrate the ICs program. In September 2009, EPA signed an Interim Record of Decision (IROD) that selected as an interim remedy continuation and strengthening of the ICs program, monitored natural recovery, and placement of a cap over the area of the Palos Verde Shelf that contains the highest surface contaminant concentrations.

In February 2015, EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to continue the community involvement activities. EA discussed the outreach previously conducted with EPA and the past contractor, reviewed the IROD and Palos Verdes Shelf Superfund Site ICs Program Implementation Plan, and contracted with past outreach community partners.

The Community Involvement Program was designed to reduce risk exposure posed by contaminated fish through outreach and education. The program has three main activities: Angler Outreach, Community Outreach, and Enforcement. In support of these activities, EA coordinated meetings with the FCEC. The FCEC is a forum for the agencies, outreach groups, and other entities involved to share ideas, get updates on the project's progress, and maintain momentum for continued outreach work. This report will discuss the outreach activities. The annual enforcement activities are documented in a separate report.

The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities. This report summarizes the extent of the outreach including:

1. Angler outreach conducted between March 2015 and July 2016
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Enforcement and pier sign monitoring activities were also performed as part of the Community Involvement Program. Enforcement activities were performed by the Department of Fish and Wildlife (recreational and commercial fishing) between January 2015 and January 2016. EA facilitated fish identification training workshops for the Los Angeles County and City of Long Beach inspectors in September 2015 and February 2016. These enforcement activities are further documented in the Annual Enforcement Report, prepared separately. The pier signs were routinely monitored by HTB and Cabrillo between February 2015 and July 2016 to assess the need for replacement or repair. Pier sign status including photos is summarized in a separate report.

2.0 OVERVIEW OF THE COMMUNITY INVOLVEMENT PROGRAM

The Community Involvement Program is one of three ICs designed to reduce risk exposure posed by the consumption of contaminated fish. The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities. This report summarizes the extent of the outreach including:

1. Angler Outreach
2. Bait Shop Outreach
3. Electronic Outreach
4. Community Event Outreach
5. FCEC Partner Meetings.

The following sections summarize each of these outreach subprograms.

2.1 ANGLER OUTREACH

HTB and Cabrillo continued the previous Angler Outreach. HTB contacted anglers at the following fishing piers located within the Palos Verdes Shelf Superfund Site contaminated sediment area between Santa Monica Pier and Seal Beach Pier (Figure 1): (1) Santa Monica; (2) Venice; (3) Hermosa Beach; (4) Redondo Beach; (5) Rainbow Harbor; (6) Pier J; (7) Belmont Pier; and (8) Seal Beach. Cabrillo contacted anglers at the Cabrillo Pier (Figure 1). HTB and Cabrillo staff educated anglers at the piers discussing the local contamination, distributed program materials 2 to 3 days per week, generally during times of highest angler population on the piers. Pier angler outreach was conducted on Thursday or Friday, Saturday, and Sunday. Face-to-face conversations were held with anglers, in the angler's native tongue, when possible. The outreach included discussions about the contamination in fish, distribution of information materials, and recording outreach activity results. The numeric objective of the HTB and Cabrillo outreach was to contact a minimum of 11,000 and 1,600 anglers, respectively, between January 2015 and July 2016.

As part of the angler outreach program, EA worked with HTB and Cabrillo to monitor 45 pier signs and maintain a record of their condition. EA reported missing or damaged signs to EPA and coordinated with the Los Angeles County Department of Public Health to complete sign removal and/or replacement. The summary of pier sign status is summarized in a separate report.

2.2 BAIT SHOP OUTREACH

HDR conducted outreach at 40 angler retail and bait shop locations in Huntington Beach, Seal Beach, Long Beach, San Pedro, Redondo Beach, Hermosa Beach, Manhattan Beach, Hawthorne, Marina Del Rey, Venice, and Santa Monica (Figure 2). HDR staff provided tip cards in English, Spanish, Vietnamese, and Chinese to bait shop managers and recorded the number of tip cards provided. Additionally, the contact email address (info@pvsfish.org) was left in case the bait shops wanted to request additional materials or had any questions. HDR also notified bait shops that materials would be replenished every six months. One follow-up visit was conducted in June 2016 to replenish materials and record the number of tip cards handed out.

2.3 ELECTRONIC OUTREACH

Electronic outreach was completed by maintaining the FCEC website (<http://www.pvsfish.org/>), Facebook page (<https://www.facebook.com/fceccprogram/>), YouTube page (<https://www.youtube.com/user/FCECvideos>), and Flickr account (<https://www.flickr.com/photos/pvsfish/>), as well through disseminating electronic newsletters. EA responded to questions emailed to the FCEC information account, posted outreach photos, upcoming events, and other announcements. EA also recorded user traffic such as the number of visitors and Facebook page "likes". The data collected (using Google Analytics) on the FCEC website included the number of visitors, page views, number of pages/session, average duration of visitor stay on the website, the bounce rate (percentage of visitors to a website who navigate

away from the website after viewing one page), whether a visitor was new or a repeat, and page views by city.

2.4 COMMUNITY OUTREACH

CHCC and BPSOS hosted and attended Chinese and Vietnamese community events and provided outreach materials within their facilities to educate these specific communities on the fish contamination and “Do Not Consume” fish. CHCC attended eight Chinese community events, and BPSOS attended ten Vietnamese community events. HDR attended ten events including African American, Hispanic, Vietnamese, Chinese, and non-specific community events. During the community events, outreach focused on distributing tip cards and information pamphlets as well as having one-on-one conversations with community members to provide fish contamination and consumption education.

2.5 FCEC PARTNER MEETINGS

The FCEC Partner meetings included the angler outreach groups, agencies, and other entities to provide feedback and recommendations for program messaging, report on the condition of posted FCEC pier signage, exchange information, and discuss issues related to the program. Further discussion of the key points from these meetings is included in Section 5.5.

3.0 DATA COLLECTION AND ANALYSIS APPROACH

3.1 ANGLER OUTREACH

HTB and Cabrillo staff conducted angler outreach from March 2015 through July 2016. The following data were recorded during the angler outreach efforts:

1. Whether an outreach angler was an adult or child.
2. Whether an outreach angler was a repeat or new respondent.
3. The number of information tip cards provided, if any (this data stopped being collected after September 2015).
4. Whether the outreach angler is aware of the contamination.
5. The language spoken during the angler outreach.
6. The zip code the angler lives in, if provided.
7. Any additional notes about the angler, such as type of fish caught, and other language(s) spoken if outreach was conducted in English.

The outreach data was analyzed to determine the effectiveness of the angler outreach activities. The total number of anglers reached at each pier was tracked on a monthly and annual basis to determine whether the numeric outreach objective was met. The overall outreach effectiveness was based on the percent of anglers aware of the fish contamination of those reached. Another measure of outreach effectiveness was based on the demographic variability of the anglers. The demographics were assessed by the total number of anglers reached in each zip code/county, and the languages spoken (English only, non-English, and multi-lingual) by county. This analysis was possible because each record in the database that had zip code information also contained the language spoken. The demographic variability data was also used to identify potential gaps in outreach within the communities.

3.2 BAIT SHOP OUTREACH

HDR conducted the initial bait shop outreach in October/November 2015 with a follow up in June 2016. During each visit, HDR collected qualitative data including how many bait shops took outreach materials and how many of the materials were distributed in each language.

3.3 ELECTRONIC OUTREACH

Data collection for the electronic outreach was performed using Google Analytics, which recorded information such as the various visitor types to the FCEC website, visitor activity on the website, and the method used to reach the website. The Google Analytics data were analyzed to determine the total number of visitors to the website, number of page views, number of pages/session, the bounce rate (the percentage of visitors to a website who navigate away from the site after viewing one page), the number of new or repeat visitors, and page views by city. The combined information from these datasets enabled a qualitative-quantitative analysis of the outreach effectiveness of the FCEC website. In addition, analytic data from the Facebook page, such as the number of likes, fans reached, and user engagement, it provided additional data to assess outreach effectiveness.

3.4 COMMUNITY EVENT OUTREACH

HDR, CHCC, and BPSOS attended a total of 28 community events. During each community event, the total number of attendees and/or tip cards distributed (English, Spanish, Chinese, and/or Vietnamese) were recorded. Similar to the other outreach datasets, the community event outreach data were analyzed to determine and compare the outreach effectiveness within each of the target communities.

4.0 RESULTS

4.1 ANGLER OUTREACH

4.1.1 Anglers Contacted During Outreach Period

Table 1 summarizes the total number of anglers contacted between March 2015 and July 2016. The table presents the following total values: (1) total per month; (2) total in 2015; (3) total in

2016; (4) total for the outreach period; (5) total for HTB locations; (6) total for Cabrillo locations. Based on the data, both HTB and Cabrillo achieved the outreach objectives by reaching at least 14,368 (goal was 11,000) and 2,406 (goal was 1,600) anglers, respectively.

Based on the monthly trends in the data, as shown in Figure 3, there appear to be seasonal fluctuations with the numbers of anglers generally increasing between March and April 2015 decreasing through June 2015, peaking between July and September 2015, and decreasing again through the following March 2016. Belmont Pier has the greatest variability, with peak anglers ranging from 197 (December 2015) to 406 (July 2015). Redondo Beach and Venice fishing locations have the next greatest variability, with peak angler outreach ranging from 188 (August 2015) to 270 (December 2015) and 79 (August 2015) to 264 (July 2015), respectively.

4.1.2 Angler Outreach Effectiveness (Contamination Awareness)

Angler outreach effectiveness was measured through direct and specific questions asking anglers if they were aware of the contamination and “Do Not Consume” fish warnings, followed by questions of when they learned of the contamination and by what media (e.g., newspaper, social media, FCEC brochure).

Angler awareness of the contamination and “Do Not Consume” warnings was collected during the outreach sessions from October 2015 through May 2016, but no additional questions were asked about how, where, and when an angler learned of the information. Table 2 summarizes the percent of anglers who responded that they were aware of the contamination and “Do Not Consume” warnings. On average, anglers reached at Cabrillo Pier had the most awareness with 79 percent of anglers aware of the contamination issues, followed by Santa Monica (70 percent), Rainbow Harbor (68 percent), and Venice (64 percent). Angler awareness was lowest at Belmont Pier at 59 percent of anglers. Of the anglers that were aware of the contamination, on average across all the piers and throughout the outreach period, 55 percent spoke English, 6 percent spoke Spanish, 5 percent spoke English/Tagalog, 4 percent spoke English/Filipino, and 3 percent spoke English/Spanish.

During March through September 2015, the outreach did not specifically ask anglers if they were aware of the contamination and the “Do Not Consume” warnings. Anglers were asked whether they were a new or repeat outreach respondent, and whether a tip card was provided. Tables 3 and 4 summarize the percent of respondents who were repeat or new respondents, respectively, for the entire outreach period. At all the fishing locations, at least 46.4 percent of anglers were new respondents. Hermosa Beach had the most new respondents (63 percent), followed by Belmont Pier (62 percent), and Seal Beach (62 percent). This data can somewhat indicate effective outreach strategy and technique because on average more than 50 percent of the anglers were new removing some bias from the results.

Because the number of repeat or new respondents data (March-September 2015) was not a direct measurement of outreach effectiveness alone, a relationship between this data and the actual effectiveness/awareness data (October 2015-July 2016) was determined; a correlation ratio between the repeat and aware respondents was calculated. For reference, correlation ratios range

between 1 and -1. The closer a value is equal to 1 or -1, the stronger the relationship between the two datasets, and the closer a value is to zero the weaker the relationship is between the datasets. Additionally, a positive value indicates positive relationship between the two datasets and vice versa. Table 5 presents the correlation ratios comparing the monthly datasets for each of the piers.

Based on the results presented in Table 5, five of the nine fishing locations (Santa Monica, Venice, Pier J, Belmont Pier, and Cabrillo Pier) have correlation ratios greater than 70 percent, indicating more than 50 percent of the variation in the data is related. However, the other four fishing locations (Hermosa Beach, Redondo Beach, Rainbow Harbor, and Seal Beach) have correlation ratios less than 37 percent, indicating the data is mostly unrelated. Because the correlation analysis shows a near split in the potential relationship of the repeat/new and aware respondent data, it would be inappropriate to attempt to use this analysis to draw a more definitive conclusion about the outreach effectiveness during the entire March 2015 through July 2016 dataset. Therefore, based solely on the awareness data from October 2015 through July 2016, between 59 and 78 percent of the anglers, on average, were aware of the contamination. The highest contamination awareness amongst the anglers was identified at Cabrillo Pier, followed by Santa Monica, with only a 9 percent difference between the remaining fishing locations.

4.1.3 Angler Outreach Effectiveness (Geographic Distribution/Demographic Variability)

During the angler outreach, anglers were asked to provide the zip code where they live. Of the 16,774 anglers reached between March 2015 and July 2016, 49.8 percent (8,347 anglers) provided their zip code. Of the anglers who provided their zip code, approximately 99 percent were from California, consisting of approximately 97 percent from Los Angeles (~86 percent), Orange (~6 percent), San Bernardino (~4 percent), and Riverside (~2 percent) counties. The remaining 2 percent are anglers from throughout California (Siskiyou County in Northern California to Ventura County just outside of Los Angeles County). Figure 4 depicts the distribution and concentration of zip codes for Los Angeles, Orange, San Bernardino, and Riverside counties. The highest zip code concentration occurs within the Cabrillo zip code of 90731. The highest concentrations appear to occur within the area bound by Interstate-110 to the west, Interstate-605 to the east, and Interstate-10 to the north. The remaining 1 percent of the anglers/pier visitors were from around the country or overseas.

Demographic variability was determined using the language data collected during the angler outreach. The efficiency of the outreach to various communities actively fishing the Palos Verdes Shelf Superfund Site was assessed by evaluating the different languages spoken geographically. There are several key aspects of this data that are important to note. The data indicate that many of the anglers responded in English, but the notes also indicate the ability to speak another language. Therefore, many of the language categories are bi- or multi-lingual. Additionally, there were instances in the data where no language spoken was filled in, resulting in missing data. Moreover, because approximately 98 percent of the angler outreach respondents were from the four surrounding counties, the analysis focused on these geographic areas.

Table 6 summarizes the language distribution spoken by the anglers. The results indicate that nearly 81 percent of the respondents within Los Angeles, Orange, San Bernardino, and Riverside spoke only English and 19 percent were non-English or multi-lingual speakers. Of the non-English or multi-lingual speakers, approximately 82 percent of respondents were only Spanish speakers, 3 percent only spoke Chinese, 1 percent only spoke Russian, and 1 percent only spoke Tagalog, and the remaining 13 percent were bi- or multi-lingual. The majority of multi-lingual speakers spoke English/Tagalog (3.4 percent), English/Spanish (1.6 percent), English/Korean (1.5 percent), English/Chinese (1.2 percent), English/Vietnamese (1.2 percent), English/Russian (1.0 percent), and English/Cambodian (1.0 percent). In summary, the demographic groups that are likely effectively being reached through the Angler Outreach Program may include a mix of white and English speaking/bi-lingual Hispanic, with a smaller minority of Chinese and Austronesian communities.

4.2 BAIT SHOP OUTREACH

In October/November 2015 and June 2016, HDR conducted outreach to 40 bait shops in the California cities of Huntington Beach, Seal Beach, Long Beach, San Pedro, Redondo Beach, Hermosa Beach, Manhattan Beach, Hawthorne, Marina Del Rey, Venice, and Santa Monica (Figure 2). A total of 1,960 tip cards were distributed in English (51 percent), Spanish (19 percent), Vietnamese (16 percent), and Chinese (14 percent).

In October and November 2015, tip cards were provided in English and Spanish; approximately a quarter of the shops took materials in both languages. Shops were notified that materials would be replenished within three-to-six months. Overall, the October and November 2015 outreach effort was successful. During this time, 880 tip cards were distributed of which 92 percent were English and 8 percent Spanish. A couple of the shops were not open during posted hours, so several visits were required. One shop was initially hesitant to take materials, but with further explanation, they took tip cards. Conversely, one shop requested additional materials because customers found them very useful. It is assumed that with continued visits, relationships will be further established with these shops and they will be very comfortable distributing these materials.

In June 2016, 1,080 tip cards were provided in English (19 percent), Spanish (27 percent), Vietnamese (30 percent), and Chinese (25 percent). Many shop managers asked for English and Spanish tip cards, with others specifically requesting all languages. Again, the bait shops were notified that materials would be replenished within the next six months. Overall, the June 2016 outreach effort was also successful. The shop managers remembered the FCEC and tip cards from the October/November 2015 outreach effort. Since then, most shops had distributed all of the materials; only a few shops still had materials from the October/November 2015 visits. Shops that had new employees and/or managers that were not familiar with FCEC and the tip cards were engaged and open to displaying and distributing the information. A few expressed gratitude that these materials were made available to their customers.

4.3 ELECTRONIC OUTREACH

Figures 5 and 6, and Table 7 summarize the Google Analytics data for the outreach period. The figures and tables present the Google Analytics datasets that were collectively used to quantify electronic outreach effectiveness. Based on the data, the website was gradually receiving more visitors, measured by the number of sessions or visits to the webpage, unique users, and page views between January and July 2015. During this time, the bounce rate and percent of new users to the website remained fairly constant, hovering around 68 and 85 percent, respectively. However, beginning in August 2015, the number of sessions, users, and page views on the website were at least 73 percent less than January to July 2015. The bounce rate and percent of new users during this period also fluctuated more than January to July 2015 period, with the bounce rate ranging from 82 to 95 percent and new users ranging from 84 to 97 percent, with an average bounce rate and percent new users of 87 and 93 percent.

The pages/session and average session duration depicts similar trends to the sessions, users, and page view data. Between January and July 2015, average pages per session was 2.16, or slightly more than 2 pages being viewed during each visit to the website. Similarly, the average duration was 1.6 minutes. However, between August 2015 and July 2016, both pages per session and average duration decreased significantly to 1.27 pages and 0.6 minutes per session. A brief spike in the average session duration occurred in March 2016, which could be attributable to the posting of the newsletter on the website and electronic distribution of the newsletter to community members on the Constant Contact emailing list.

In addition to, overall website usage, Google Analytics tracks demographic data, specifically country, region/state, and city, and metro area. For the purposes of this analysis, the city level data was evaluated. Similar to the angler outreach analysis, visitors to the website were primarily from California (70 percent of users with geographic tracking turned on and 60 percent of all visitors to the website). In California, the top five cities with visitors to the website include Los Angeles, San Diego, San Francisco, Long Beach, and Irvine. Approximately 30 percent of visitors to the website were from Los Angeles (2,531 sessions), followed by 6 percent from San Diego (485 sessions), 4 percent from San Francisco (345 sessions), 4 percent from Long Beach (328 sessions), and 2 percent from Irvine (148 sessions).

The Facebook analytics data are presented in Figures 7 and 8. Figure 7 depicts the number of likes the Facebook page received from January 2015 through Jul 2016. Figure 8 presents the number of fans reached and percent of users engaged during the outreach period for each post to the Facebook page. The number of likes on the Facebook page remained fairly constant through February 2015, hovering around 5,221 likes. However, similar to, but prior to the Google Analytics data, the number of likes dropped significantly in early March by 243 likes in a single day. Since then, the number of likes has been declining at a rate of approximately 1 like every 4 days.

To evaluate the reach and engagement of posting information on the Facebook page, Facebook analytics data provide the total number of fans reached, the total number of fans reached who also liked the Facebook page, the percent of engaged users relative to the fans reached, and the

percent of engaged users relative to the number of fans reached who also like the Facebook page. Between January 2015 and July 2016, there have been 14 posts to the Facebook page, with, on average, a total fan reach of 150 and 3 percent engagement. Of the fans reached, on average 107 (71 percent) also liked the Facebook page, and approximately 4 percent were engaged in the post. These results are averages, but between the first post in July 2015, and the last post in May 2016, there is large variability in reach and engagement for individual posts, with some posts receiving little to no fans reached or engaged.

4.4 COMMUNITY OUTREACH

HDR attended 10 community events between March 2015 and June 2016, including African American, Hispanic, Vietnamese, Chinese, and non-specific community events. Below is the list of community events attended by HDR during the outreach period:

1. 40th Anniversary Fall of Saigon (April 25, 2015)
2. 14th Annual Baja Splash Cultural Festival (September 26, 2015)
3. African American Festival (February 27, 2016)
4. Noches de Estrellas (March 18, 2016)
5. International Children's Day (April 9, 2016)
6. Earth Day Celebration (April 23, 2016)
7. Fiesta Broadway (April 25, 2016)
8. Urban Ocean Festival (April 30, 2016)
9. City of Torrance Environmental Fair (June 4, 2016)
10. Lummis Day (June 5, 2016).

In total, approximately 4,150 people attended the events. HDR was able to hand out tip cards to 62.5 percent of the attendees, of which 44.4 percent were English, 16.8 percent Spanish, 0.6 percent Vietnamese, and 0.8 percent Chinese.

CHCC attended eight community events during the outreach period, targeted primarily at Chinese community members. Below is the list of community events attended by CHCC during the outreach period:

1. Father's Day Celebration (June 13, 2015)
2. Moon Festival 2015 (August 22, 2015)
3. Harvest Moon Festival (September 13, 2015)
4. Walnut Fair (October 10, 2015)
5. Alhambra Luna Festival (February 13, 2016)
6. CHCC Walkathon (April 9, 2016)
7. Spring Awakening (May 22, 2016)
8. Salute to Veteran & Families (May 28, 2016).

In total, 42,300 people attended the events. CHCC was able to hand out tip cards to 8.8 percent of the attendees, of which 81 percent were Chinese and 19 percent were English. Although these percentages appear low, relative to the number of people attending the HDR and BPSOS community events, as well as the total number of anglers contacted during the outreach period,

this number reflects a significant number of community members being reached through community events. Furthermore, the majority of the people reached were Chinese-speaking representing that targeting Chinese focused events is an effective outreach method. This is counter to the angler outreach, which is less effectively reaching the Chinese community.

BPSOS attended 10 community events during the outreach period, targeted primarily at Vietnamese communities. Below is the list of community events attended by BPSOS during the outreach period:

1. Asian Mall Night Market (August 22, 2015)
2. 6th Annual County Health Fair (September 19, 2015)
3. 4th Annual Southland Health Center Community Health Fair (October 10, 2015)
4. Vietnamese Physicians Association of Southern California Free Health Fair (October 11, 2015)
5. Baxter Healthcare & Safety Fair (November 6, 2015)
6. Nhan Hoa Clinic Health & Wellness Fair (November 7, 2015)
7. CalOptima Health & Wellness Community Event (November 11, 2015)
8. Mini-Service Fair at Vietnamese American Cancer Foundation (February 26, 2016)
9. Mental Health Awareness Event (May 25, 2016)
10. Quarterly Networking Luncheon for Vietnamese-American Human Service Providers (June 15, 2016)

In total, 4,465 people attended the events with 50 percent receiving tip cards from BPSOS staff. Similar to HDR and CHCC, the data show that outreach at the community events is effective and is further spreading awareness of the contamination issues at the Palos Verdes Shelf Superfund Site.

5.0 DISCUSSION AND RECOMMENDATIONS

The Community Involvement Program, through the various outreach activities at multiple locations, has been effective in reaching anglers and community members to increase awareness of the contamination issues associated with the Palos Verdes Shelf Superfund Site. The following sections discuss conclusions and recommendations for each aspect of the outreach program.

5.1 ANGLER OUTREACH

Through the angler outreach, both HTB and Cabrillo were able to surpass the outreach objective between March 2015 and July 2016. Additionally, the awareness data collected was also conclusive that the majority of anglers, especially at the more popular fishing locations were, on average, aware of the contamination. Most importantly, of the data collected, the results of the geographic distribution and demographic variability expose several interesting conclusions about the overall effectiveness of the Angler Outreach Program. The geographic distribution of the outreach data shows the program is effectively reaching the local communities in the greater Los Angeles area potentially affected by the consumption of fish from the Palos Verdes Shelf Superfund Site. Similarly, the demographic variability data, as measured through the angler languages spoken, present a wide variety of ethnicities and cultures being reached through the outreach program.

Although the above results were measurable from the collected data, there is significant room for improvement in the type of data collected. Relative to awareness, it would be beneficial for future outreach to include additional data points to be able perform more in-depth sensitivity analyses, which would help with identifying more accurate methods to improve angler and other outreach. Such data points would include: (1) the form of media the angler learned of the contamination; (2) approximate month and year the angler learned of the contamination; and (3) if the angler has shared his or her knowledge with other anglers or community members, and if so, how many.

With regards to the geographic distribution and demographic variability, several data collection improvements are recommended for future outreach. To better understand and visualize the geographic distribution of the anglers through the outreach program, it would be beneficial to collect city data in conjunction with the zip code data. This would improve the number of respondents included in the geographic distribution statistics and provide a broader picture of the outreach effectiveness beyond the individual and zip code levels.

5.2 BAIT SHOP OUTREACH

Overall the October/November 2015, and June 2016 bait shop outreach events were successful. The majority of the shops distributed the information materials and in some cases needed replenishment sooner than the prescribed three to six months. It was recommended to target local fish markets in addition to the bait shops to distribute tip cards and further help angler outreach. Several observations were noted during the outreach events that could potentially improve the overall effectiveness to reach anglers and the community, as discussed below.

During the October/November 2015 outreach visits, many shops took/requested materials in English. It would have been beneficial to offer materials in other languages considering the diversity of these communities. Additionally, it was noted that it is necessary to provide contact information for shop owners and managers to establish a two-way dialogue should they have any questions or want to request additional materials.

During the June 2016 outreach visits, two bait shops in the San Pedro and Seal Beach areas requested information materials in Korean. While it was only those two shops, it may be worth reevaluating the demographics in these communities to determine if tip cards should be provided in Korean. It should be noted that based on the angler outreach data, English/Korean-speaking anglers ranked 6th highest, following English/Tagalog and English/Spanish.

Additionally, during the June 2016 visits, it was identified that a phone number as well as an email address should be provided to bait shops if they have any questions or wanted to request more materials. Due to the demographics of some of these communities, it would be beneficial to consider identifying a phone or hotline number that could be distributed in future bait shop outreach efforts.

Another observation that arose from the outreach visits in June 2016 was that many of the bait shops still had the small disposable card holders that were previously provided, but some had thrown them away. Though future visits will be focused on replenishing supplies of tip cards, these disposable card holders should be made available again and include FCEC information and the website should materials run out.

Lastly, during the June 2016 outreach effort, one bait shop located in San Pedro on the docks near many tourist and private fishing boats expressed an issue with local angler outreach. The bait shop serves many of these local fishing boats and some of the captains do not appreciate when angler outreach is conducted prior to their boats leaving for the day. They feel the outreach deters customers from boarding their boats. This manager gladly accepted the materials for distribution at the bait shop because it would be the choice of the customer to review the information, rather than FCEC partners trying to engage his customers directly, which he felt caused unnecessary alarm. Because this issue would likely have little to no effect on the angler outreach, this may be a revision to consider for future bait shop outreach events. Another consideration for future outreach events includes targeting local fish markets, in addition to the bait shops, to distribute tip cards.

5.3 ELECTRONIC OUTREACH

The Google Analytics for the FCEC website and Facebook page data present some interesting conclusions about the effectiveness of the two media in reaching the public.

The Google Analytics data indicate that since July 2015, visits to the FCEC website have been relatively minimal, and even when the website receives visitors, there is little to no engagement, as reflected by the bounce rate, page views per session, and average session duration. A deeper look at the top five pages visited after July 2015 showed that the pages visited were not the main pages of the website providing information on the contamination, fishing piers, or fish, but rather to blog posts from 2010 through 2013. Based on these results, the website is not effectively reaching the public, but is more likely acting solely as a resource in the event people need additional information.

The Facebook data evaluated suggest similar outreach effectiveness to the Google Analytics data on the website. Since March 2015, the Facebook page has seen a steady drop in the number of

users who like the page, which is likely due to the lack of activity on the Facebook page, such as posts, comments, and or responses to posts and comments. Even so, when posts were published on the FCEC Facebook page, the data indicated that the posts did not effectively reach or engage the general Facebook population or users who liked the page. Overall, the Facebook page is also not effectively reaching the public.

Enhancements to the FCEC website and Facebook page content and activity could potentially improve the effectiveness of electronic outreach. Because the bounce rate for the FCEC website has remained above 80 percent since July 2015, it appears that users arrive to the website and leave because they cannot find what they are looking for. A reorganization of the content and/or a revision to the visual layout of the FCEC website homepage may enhance the ability for people to navigate and find specific links or additional pages they would like to visit. Enhancing the content on the Facebook page may also help increase visits to, likes, reach, and engagement of the Facebook page. This could involve posting more frequently about all the types of activities the FCEC is involved with, including changes to FCEC website, community events, and angler outreach events. The existing network could be leveraged by encouraging partner organizations to post, tag, and share content through their network. The more social media traffic generated through posts, as well as links back to the website, should improve the overall effectiveness of both the FCEC website and Facebook page.

5.4 COMMUNITY EVENT OUTREACH

The community outreach events have been effective at distributing information materials to the target communities. Although this method of outreach has been highly effective, several observations and potential improvements to the community events and information materials have been identified.

Following the community events, HDR observed that educational focused events (e.g., Earth Day, Torrance Environmental Fair) attracted a larger and more diverse crowd of people, including educators and students, willing to learn about fish safety. Therefore, it was recommended to target events with an environmental and/or educational theme. HDR noticed that children were attracted to the booth by the fishing game and often led their parents there to engage. Additionally, it is recommended to have stickers and/or coloring materials to give away to children at these events to help attract additional attention to the table and ensure everyone leaves with information. The large display board features outreach to fish markets and anglers, however, it would be worthwhile to add information about outreach for local educators, schools and/or school districts to help attract teachers to the booth. Additionally, the FCEC 'booth in the box' display was recommended to be updated. For instance, the large display board can be updated to include remediation and enforcement information as well as interactive displays. Additionally, materials such as the broken fishing rods for the fishing game need replacement.

Following their community events, CHCC identified that the majority of the individuals who approached the booths were families with young children, expressing their concern in finding out about fish safety. As a result, these families took one or more tip cards and pamphlets and stated that it was good to have the information. Additionally, CHCC observed that the fishing game is

the main reason families are attracted to approach the booth, thus giving enough time to explain the problem to the whole family while their children were fishing.

BPSOS identified during their Vietnamese community events that many events were health fair events, which are usually held in the fall/winter due to access to free flu shots. For these events, BPSOS was invited by organizations who BPSOS has partnered with in the past. BPSOS is continuing to collaborate with other organizations in order to be invited to partner organization community events. It is recommended to diversify the community events, beyond health fair events, to reach more anglers in the Vietnamese Community.

Other issues noted for the Vietnamese community was that it is necessary to distribute more and a wider variety of materials. At this time, BPSOS is only distributing tip cards, but would like to distribute other materials such as the information magnets that were developed. The more materials available to perform outreach, the community will be more receptive to the information the FCEC and BPSOS are trying to provide. The tip card is a good method to entice people to come to the information tables at community events, but additional outreach material in a more practical or unique form would be great tools for attracting people to FCEC's content. Due to the recent issue of the industrial pollution in Vietnam where millions of contaminated fish has washed ashore, the community seems to have more concern than before.

5.4 FCEC PARTNER MEETINGS

During the April 2015 FCEC Partner meeting, stakeholders discussed the angler, community, and enforcement. Some key points from the meeting included plans to expand the outreach to African-American and Hispanic community groups. BPSOS and CHCC both expressed the need for tip-cards in Vietnamese, Chinese, and English. CHCC expressed concern that many people in the Chinese community were not aware of the fish contamination despite the education efforts. Additionally, HTB raised the issue of night fishing, which is not included in the angler outreach program due to safety concerns. Therefore, some of the angler population may be missed.

During the November 2015 meeting, the community outreach was evaluated for improvements of data collection and approach. At this time, many recommendations were made to improve the program. Requests included continued collection of zip code data, additional materials be made available (specifically the Common Subsistence and Sport Fish of Southern California card in multiple languages), and potentially other languages be represented in the tip cards including Russian and Tagalog. Other recommendations included posting the "Do Not Consume" fish sign at the cleaning stations available at some of the piers. HTB handed out buckets with "Do Not Consume" fish stickers to anglers at the piers. This practice was well received and should be considered for inclusion in the program. As part of this effort, EPA agreed to consider other low-cost items that would be appropriate to give away as educational materials such as coloring book pages with crayons or other items that display the "Do Not Consume" fish and FCEC logo. Another recommendation included outreach to schools in the Los Angeles Unified School District to educate parents through children, using the curriculum available from the National Oceanic and Atmospheric Administration publications.

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FIGURES

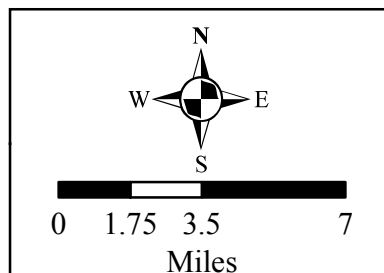
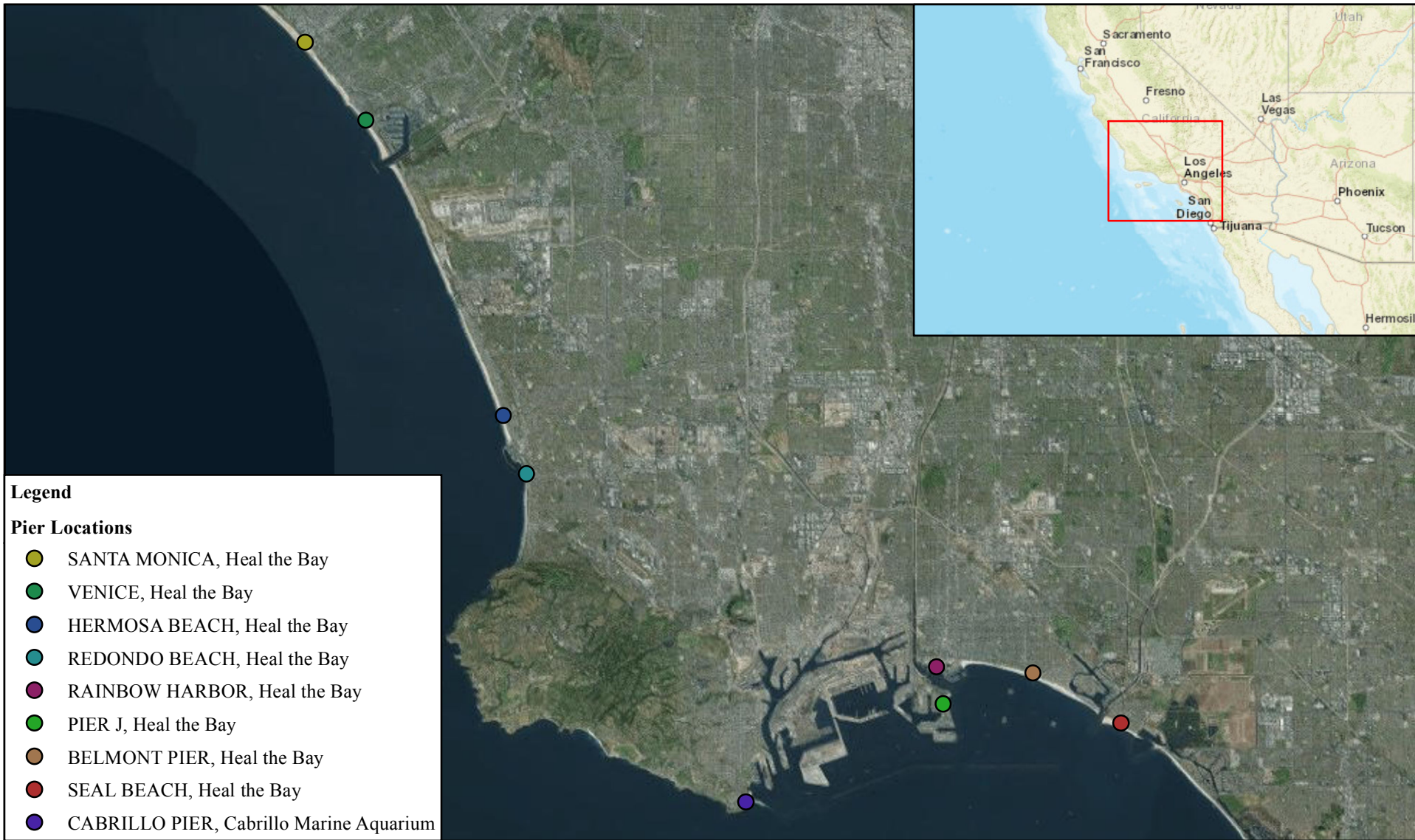


Figure 1. Overview Map

Palos Verdes Shelf Superfund Site
Los Angeles County, California

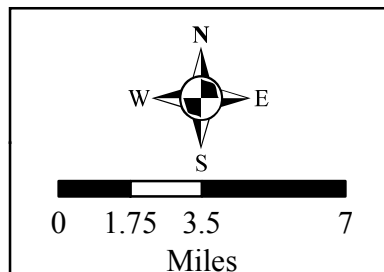
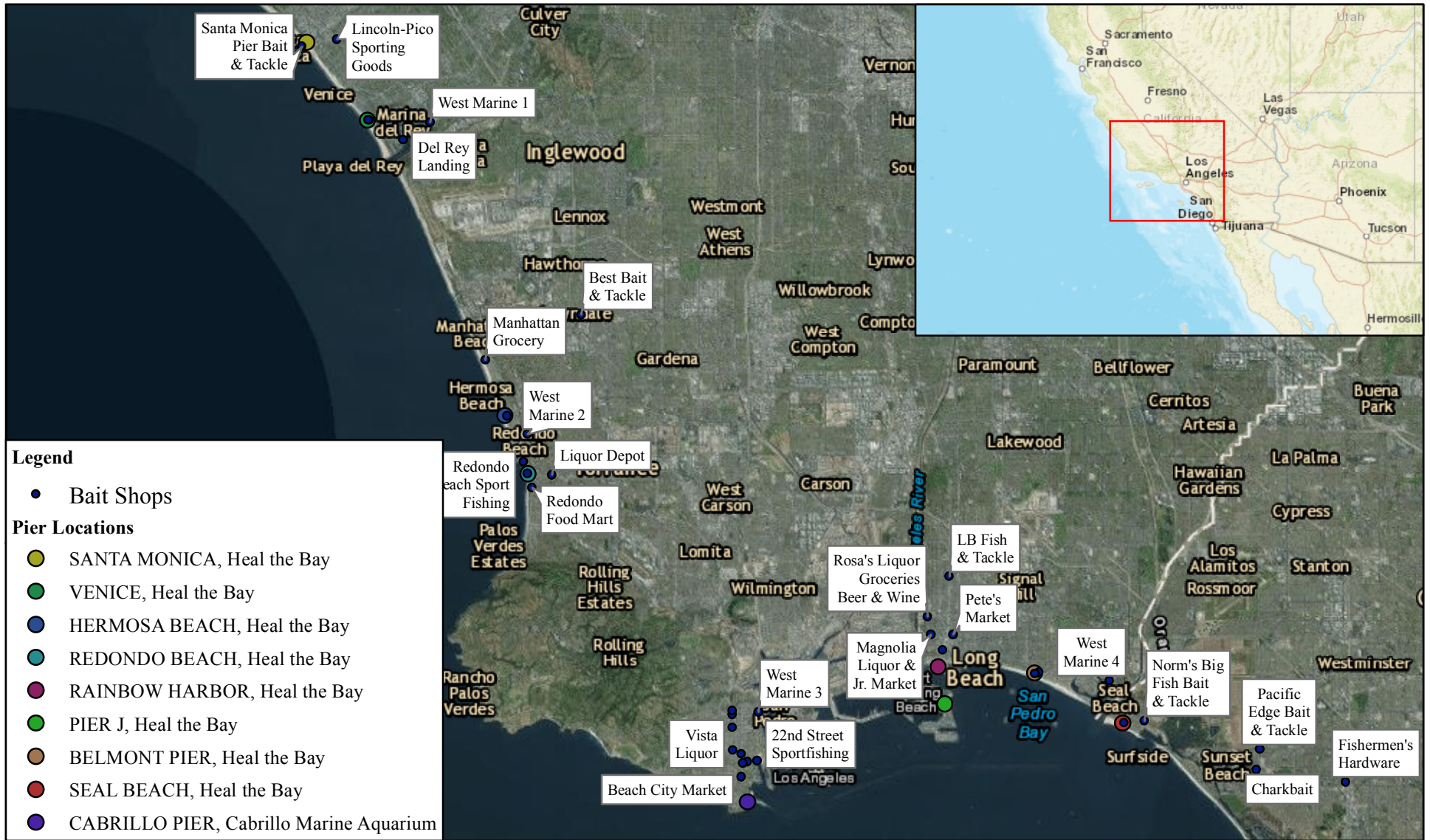


Figure 2. Bait Shop Locations

Palos Verdes Shelf Superfund Site
Los Angeles County, California

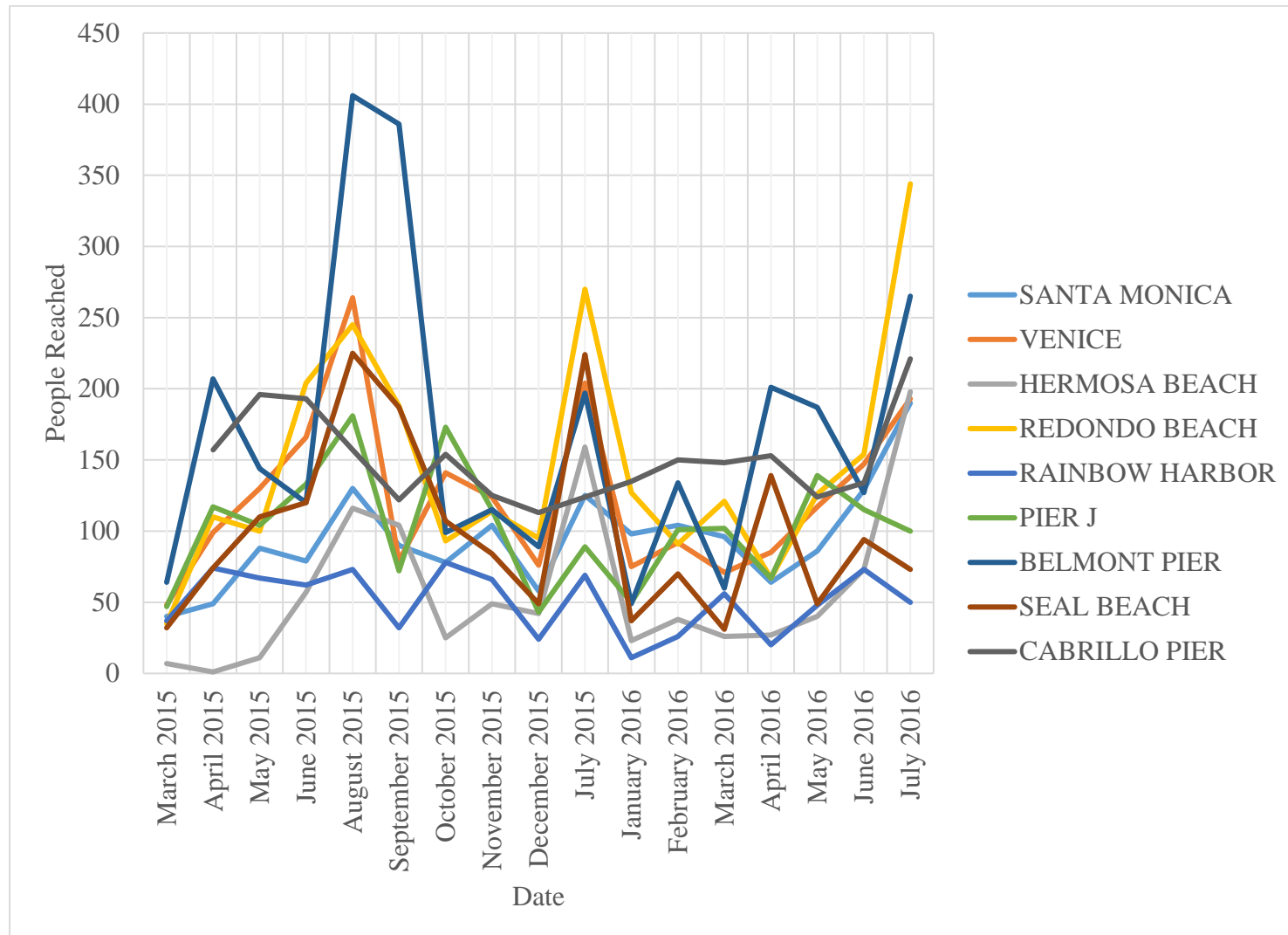


Figure 3. Seasonal Fluctuation in the Number of Anglers Contacted

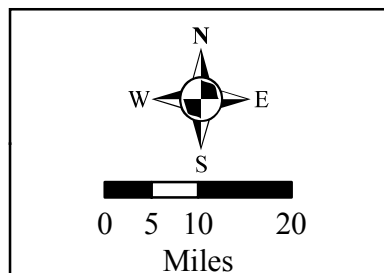
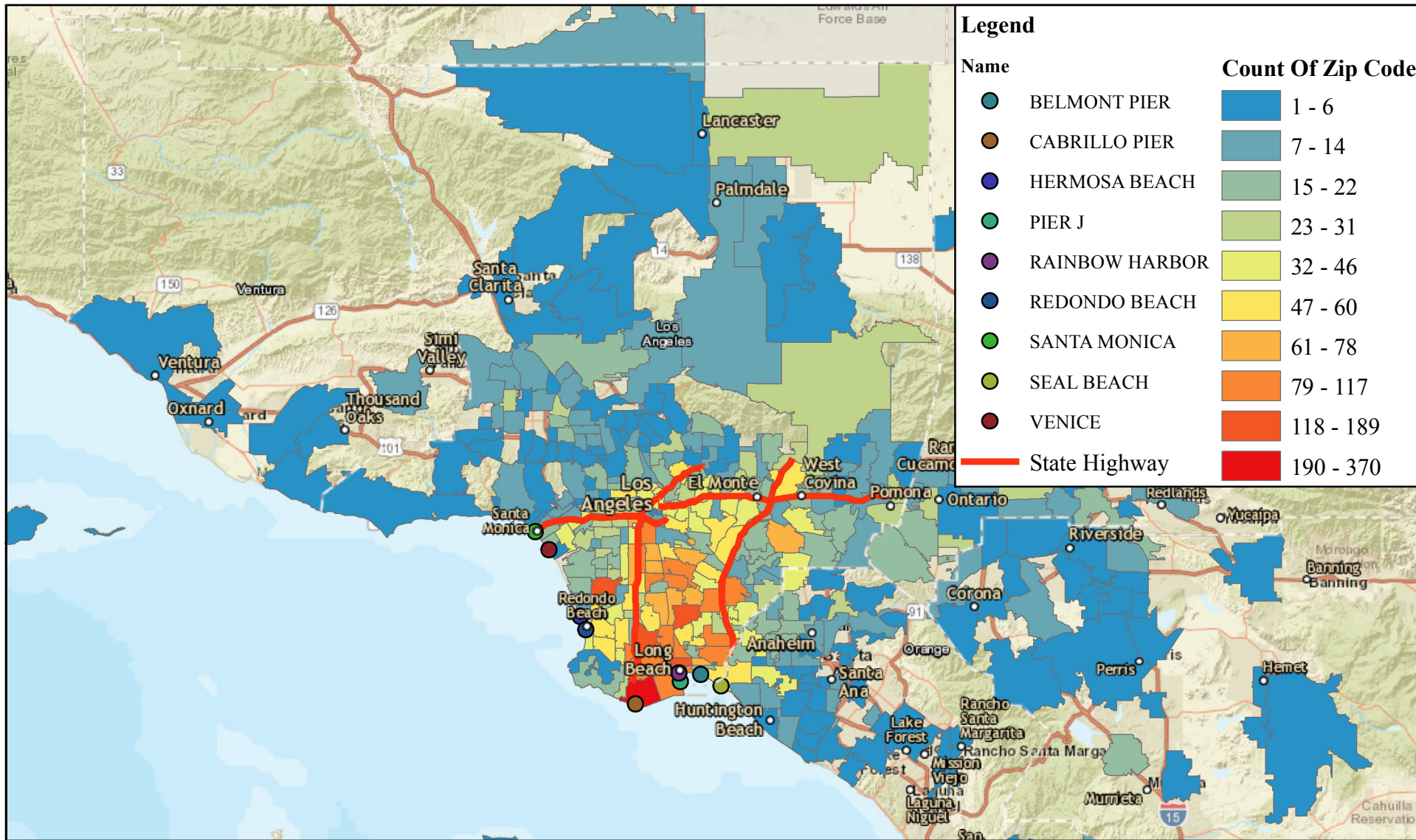


Figure 4. Geographic Distribution of Angler Zip Codes within Los Angeles, San Bernardino, and Riverside Counties

Palos Verdes Shelf Superfund Site
Los Angeles County, California

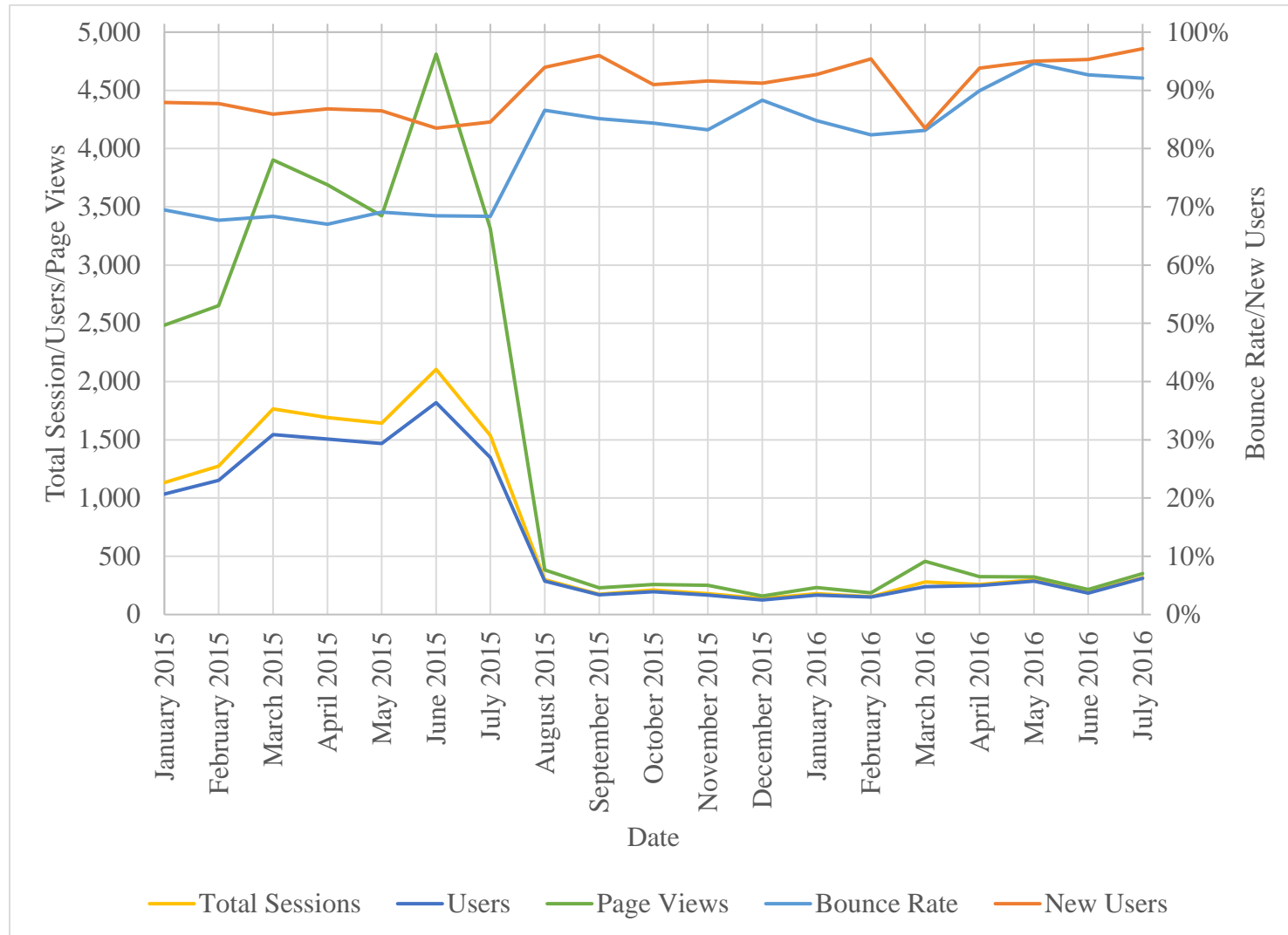


Figure 5. Total Sessions, Users, Page Views, Bounce Rate, and New Users



Figure 6. Pages per Session and Average Session Duration

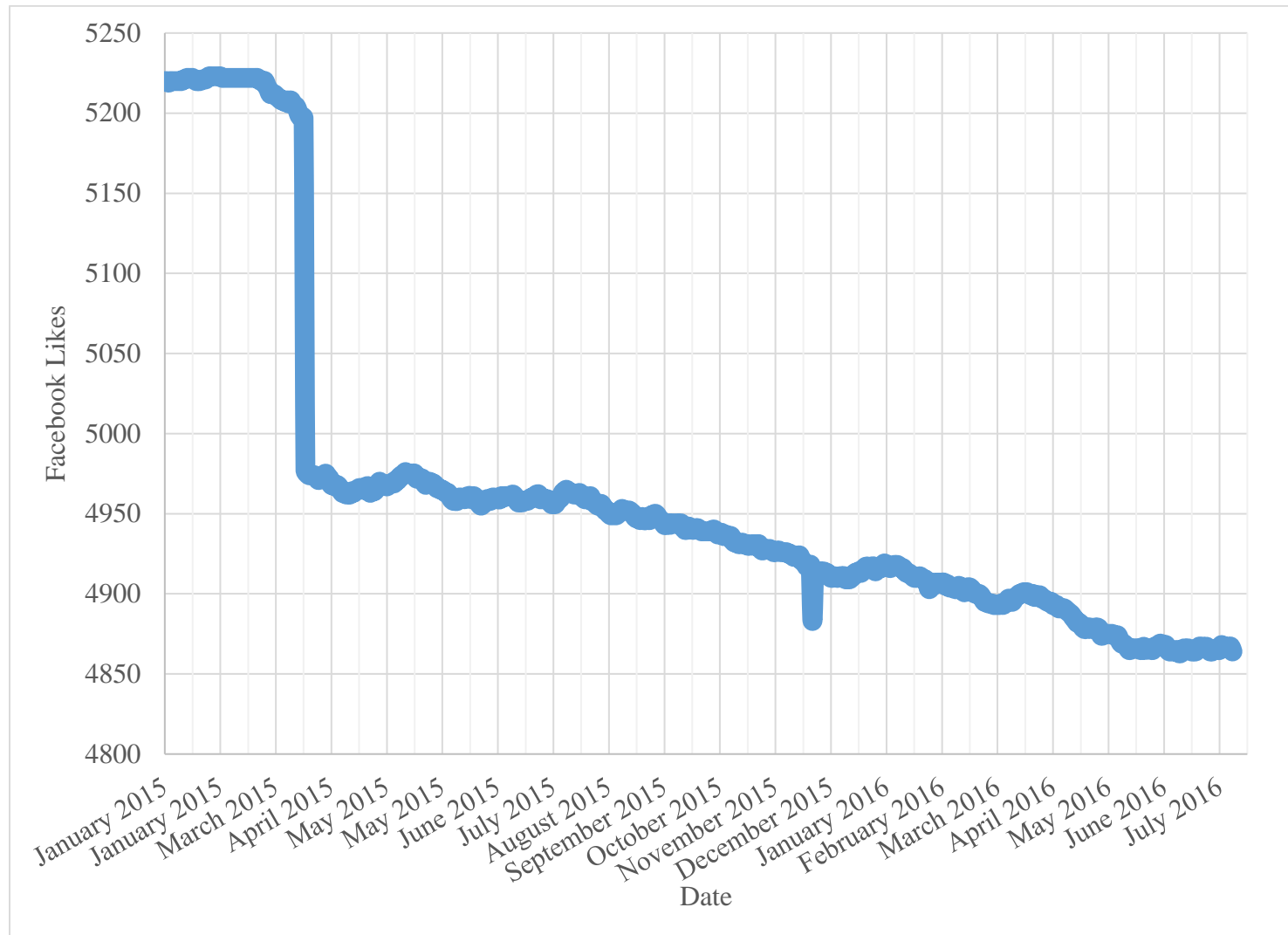


Figure 7. Number of “Likes” Received by the FCEC Facebook Page

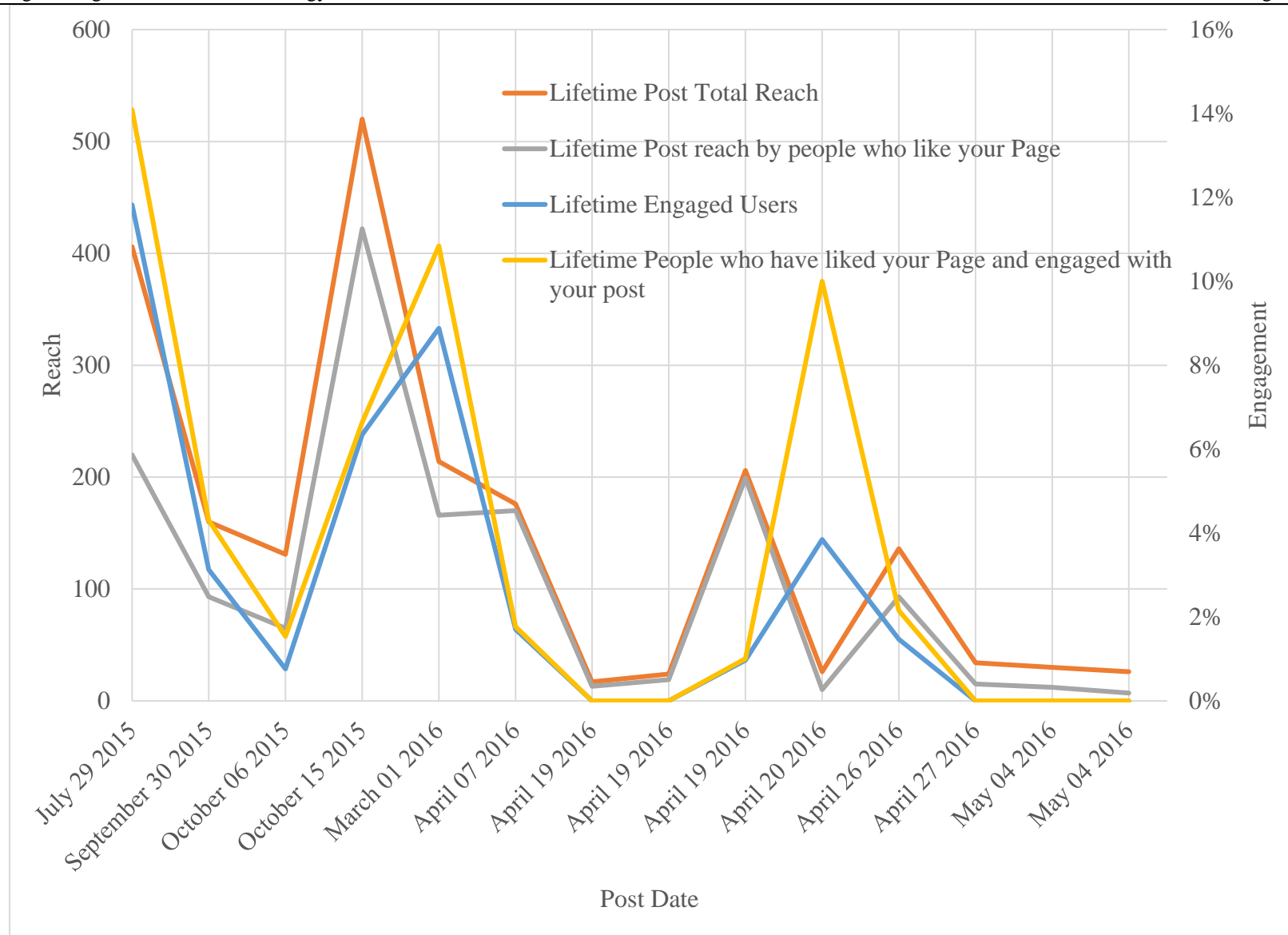


Figure 8. Total Number of Users Reached and Engaged by Posts to FCEC Facebook Page

TABLES

Table 1. Anglers Contacted During Outreach Period

Date	SANTA MONICA	VENICE	HERMOSA BEACH	REDONDO BEACH	RAINBOW HARBOR	PIER J	BELMONT PIER	SEAL BEACH	CABRILLO PIER	TOTAL
March 2015	40	48	7	35	37	47	64	32	--	310
April 2015	49	99	1	110	74	117	207	74	157	888
May 2015	88	130	11	100	67	104	144	110	196	950
June 2015	79	166	57	204	62	133	120	120	193	1,134
July 2015	130	264	116	245	73	181	406	225	157	1,797
August 2015	90	79	104	188	32	72	386	187	122	1,260
September 2015	78	141	25	93	78	173	99	107	154	948
October 2015	104	124	49	114	66	115	115	84	125	896
November 2015	58	76	42	95	24	43	89	49	113	589
December 2015	125	204	159	270	69	89	197	224	124	1,461
January 2016	98	75	23	127	11	50	49	37	135	605
February 2016	104	92	38	91	26	101	134	70	150	806
March 2016	96	71	26	121	56	102	60	31	148	711
April 2016	64	85	27	67	20	67	201	139	153	823
May 2016	86	117	40	126	48	139	187	49	124	916
June 2016	129	147	73	154	73	115	127	94	134	1,046
July 2016	190	193	198	344	50	100	265	73	221	1,634
Total (2015)	841	1,331	571	1,454	582	1,074	1,827	1,212	1,341	10,233
Total (2016)	767	780	425	1,030	284	674	1,023	493	1,065	6,541
Total (Outreach Period)	1,608	2,111	996	2,484	866	1,748	2,850	1,705	2,406	16,774

Table 2. Anglers Aware of Contamination and “Do Not Consume” Warnings

Date	SANTA MONICA (%)	VENICE (%)	HERMOSA BEACH (%)	REDONDO BEACH (%)	RAINBOW HARBOR (%)	PIER J (%)	BELMONT PIER (%)	SEAL BEACH (%)	CABRILLO PIER (%)	AVERAGE (%)
October 2015	48.7	53.9	88.0	77.4	70.5	68.8	71.7	86.0	56.5	69.1
November 2015	76.9	73.4	63.3	54.4	68.2	58.3	77.4	52.4	76.0	66.7
December 2015	87.9	65.8	59.5	80.0	87.5	76.7	36.0	59.2	73.5	69.6
January 2016	77.6	82.7	65.2	59.1	54.5	76.0	65.3	64.9	90.4	70.6
February 2016	73.1	60.9	34.2	64.8	65.4	71.3	56.7	55.7	86.0	63.1
March 2016	68.8	69.0	53.8	43.0	66.1	48.0	56.7	64.5	81.8	61.3
April 2016	65.6	49.4	44.4	50.7	45.0	52.2	49.8	48.9	75.2	53.5
May 2016	64.0	49.6	55.0	68.3	60.4	51.8	51.9	53.1	93.5	60.8
June 2016	79.1	61.9	71.2	70.1	80.8	67.8	69.3	51.1	79.1	70.0
July 2016	59.5	71.0	76.8	77.6	86.0	48.0	58.1	67.1	72.9	68.5
Average	70.1	63.8	61.2	64.5	68.4	61.9	59.3	60.3	78.5	65.3

Table 3. Repeat Respondents to Angler Outreach

Date	SANTA MONICA (%)	VENICE (%)	HERMOSA BEACH (%)	REDONDO BEACH (%)	RAINBOW HARBOR (%)	PIER J (%)	BELMONT PIER (%)	SEAL BEACH (%)	CABRILLO PIER (%)	AVERAGE (%)
March 2015	30.0	31.3	57.1	42.9	29.7	21.3	28.1	25.0	100.0	40.6
April 2015	59.2	39.8	100.0	41.8	16.4	30.8	25.1	51.4	34.4	44.3
May 2015	52.3	47.7	9.1	36.0	22.4	40.4	29.9	28.2	46.0	34.7
June 2015	60.3	35.5	20.0	38.9	22.6	30.0	35.6	40.7	36.4	35.6
July 2015	42.4	37.3	17.0	40.0	42.0	36.0	26.4	24.6	45.9	34.6
August 2015	50.4	42.4	41.4	35.9	41.1	41.4	30.3	25.3	53.5	40.2
September 2015	50.0	60.8	10.6	21.8	50.0	30.6	24.9	23.2	45.8	35.3
October 2015	38.5	41.8	24.0	34.4	24.4	62.4	50.5	20.6	35.8	36.9
November 2015	73.1	60.5	59.2	51.8	59.1	56.5	60.9	47.6	45.2	57.1
December 2015	70.7	57.9	57.1	71.6	79.2	62.8	36.0	59.2	55.0	61.0
January 2016	71.4	70.7	60.9	55.1	54.5	70.0	59.2	64.9	65.9	63.6
February 2016	52.9	51.1	23.7	56.0	53.8	44.6	38.1	54.3	56.8	47.9
March 2016	61.5	49.3	38.5	43.0	48.2	47.1	43.3	54.8	56.8	49.2
April 2016	56.3	35.3	40.7	41.8	45.0	47.8	38.3	36.0	36.8	42.0
May 2016	53.5	43.6	37.5	46.0	31.3	41.7	43.3	44.9	53.7	43.9
June 2016	51.2	44.2	54.8	39.6	35.6	43.5	49.6	36.2	51.5	45.1
July 2016	38.1	44.0	43.4	42.7	52.0	29.0	28.7	13.9	42.8	37.2
Average	53.6	46.7	40.9	43.5	41.6	43.3	38.1	38.3	50.7	44.1

Table 4. New Respondents to Angler Outreach

Date	SANTA MONICA (%)	VENICE (%)	HERMOSA BEACH (%)	REDONDO BEACH (%)	RAINBOW HARBOR (%)	PIER J (%)	BELMONT PIER (%)	SEAL BEACH (%)	CABRILLO PIER (%)	AVERAGE (%)
March 2015	70.0	68.8	42.9	57.1	70.3	78.7	71.9	75.0	--	66.8
April 2015	40.8	60.2	--	58.2	83.6	69.2	74.9	48.6	65.6	62.6
May 2015	47.7	52.3	90.9	64.0	77.6	59.6	70.1	71.8	54.0	65.3
June 2015	39.7	64.5	80.0	61.1	77.4	70.0	64.4	59.3	63.6	64.4
July 2015	57.6	62.7	83.0	60.0	58.0	64.0	73.6	75.4	54.1	65.4
August 2015	49.6	57.6	58.6	64.1	58.9	58.6	69.7	74.7	46.5	59.8
September 2015	50.0	39.2	89.4	78.2	50.0	69.4	75.1	76.8	54.2	64.7
October 2015	61.5	58.2	76.0	65.6	75.6	37.6	49.5	79.4	64.2	63.1
November 2015	26.9	39.5	40.8	48.2	40.9	43.5	39.1	52.4	54.8	42.9
December 2015	29.3	42.1	42.9	28.4	20.8	37.2	64.0	40.8	45.0	39.0
January 2016	28.6	29.3	39.1	44.9	45.5	30.0	40.8	35.1	34.1	36.4
February 2016	47.1	48.9	76.3	44.0	46.2	55.4	61.9	45.7	43.2	52.1
March 2016	38.5	50.7	61.5	57.0	51.8	52.9	56.7	45.2	43.2	50.8
April 2016	43.8	64.7	59.3	58.2	55.0	52.2	61.7	64.0	63.2	58.0
May 2016	46.5	56.4	62.5	54.0	68.8	58.3	56.7	55.1	46.3	56.1
June 2016	48.8	55.8	45.2	60.4	64.4	56.5	50.4	63.8	48.5	54.9
July 2016	61.9	56.0	56.6	57.3	48.0	71.0	71.3	86.1	57.2	62.8
Average	46.4	53.3	62.8	56.5	58.4	56.7	61.9	61.7	52.4	56.7

Table 5. Correlation and Relatedness of Repeat and Aware Respondent Datasets

Correlation Ratio	SANTA MONICA (%)	VENICE (%)	HERMOSA BEACH (%)	REDONDO BEACH (%)	RAINBOW HARBOR (%)	PIER J (%)	BELMONT PIER (%)	SEAL BEACH (%)	CABRILLO PIER (%)
Correlation	79.1	83.3	16.8	15.4	29.2	69.7	72.7	-36.5	77.1
Relatedness	62.6	69.4	2.8	2.4	8.5	48.5	52.9	13.3	59.4

Table 6. Languages Spoken by Anglers from Los Angeles, Orange, San Bernardino, and Riverside Counties.

Language Spoken	Los Angeles (%)	Orange (%)	San Bernardino (%)	Riverside (%)	Total (%)
Spanish	74.9	2.5	2.1	2.7	82.2
Chinese	3.2	0.1	0.0	0.1	3.4
English/Tagalog	3.0	0.3	0.1	0.1	3.4
English/Spanish	1.5	0.1	0.0	0.0	1.6
English/Korean	1.4	0.0	0.1	0.1	1.5
English/Russian	1.0	0.0	0.0	0.0	1.0
English/Cambodian	1.0	0.0	0.0	0.0	1.0
English/Chinese	1.0	0.3	0.0	0.0	1.2
English/Filipino	0.9	0.0	0.0	0.0	0.9
English/Vietnamese	0.8	0.0	0.0	0.0	0.8
Russian	0.8	0.3	0.0	0.0	1.1
Tagalog	0.7	0.0	0.0	0.0	0.7
English/Samoan	0.3	0.0	0.0	0.0	0.3
English/Armenian	0.2	0.0	0.0	0.0	0.2
English/Greek	0.1	0.0	0.0	0.0	0.1
English/Japanese	0.1	0.0	0.0	0.0	0.1
English/Spanish/Japanese	0.1	0.0	0.0	0.0	0.1
English/Vietnamese/French	0.1	0.0	0.0	0.0	0.1
English/Arabic	0.0	0.0	0.0	0.3	0.3
English/Italian	0.0	0.1	0.0	0.0	0.1
Total	91.0	3.6	2.2	3.3	100.0

Table 7. Summary of Google Analytics Data

Date	Total Sessions	Users	Page Views	Pages/ Session	Average Session Duration	Bounce Rate (%)	New Users (%)	Returning Users (%)
January 2015	1,133	1,034	2,483	2.19	1.5	69	88	12
February 2015	1,273	1,153	2,652	2.08	1.5	68	88	12
March 2015	1,765	1,546	3,902	2.21	1.6	68	86	14
April 2015	1,692	1,507	3,689	2.18	1.6	67	87	13
May 2015	1,643	1,467	3,424	2.08	1.6	69	86	14
June 2015	2,105	1,819	4,811	2.29	1.8	68	84	16
July 2015	1,537	1,348	3,312	2.15	1.6	68	85	15
August 2015	298	287	382	1.28	0.6	87	94	6
September 2015	175	169	230	1.31	0.8	85	96	4
October 2015	211	196	257	1.22	0.5	84	91	9
November 2015	179	168	250	1.4	0.7	83	92	8
December 2015	137	125	159	1.16	0.4	88	91	9
January 2016	178	167	231	1.3	0.5	85	93	7
February 2016	153	151	186	1.22	0.3	82	95	5
March 2016	279	240	456	1.63	1.6	83	84	16
April 2016	258	249	326	1.26	0.4	90	94	6
May 2016	300	287	322	1.07	0.2	95	95	5
June 2016	191	183	214	1.12	0.6	93	95	5
July 2016	316	311	351	1.11	0.2	92	97	3