



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

**August 2017 –July 2018**

**Palos Verdes Shelf Superfund Site**

**Los Angeles County, California**

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***Prepared for***

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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 continue 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 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 August 2017 and July 2018.
2. Bait shop outreach conducted in August-September 2017 and May 2018.
3. Electronic outreach on the FCEC website and Facebook page conducted between August 2017 and July 2018.
4. Community events attendance between August 2017 and July 2018.

EA subcontracted Heal the Bay (HTB) and Cabrillo Marine Aquarium (Cabrillo) to perform angler outreach; team subcontractor, HDR, Inc. (HDR), to complete the bait shop outreach and attend community events; and Chinese Christian Herald Crusade (CCHC) and Boat People SOS (BPSOS) 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. One FCEC partners meeting was held in January 2018, and was coordinated and facilitated by EA.

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 August 2017 and July 2018. Additionally, the City of Long Beach Department of Health and Human Services, Bureau of Environmental Health (City of Long Beach) and the Los Angeles County Department of Public Health (LACDPH) collected enforcement inspection data (markets and restaurants) from July 2017 to July 2018. The enforcement activities are further documented in the Annual Enforcement Report, submitted separately. The pier signs were monitored by HTB, Cabrillo, and City of Long Beach during the reporting period to assess the need for replacement or repair. Pier sign status is summarized in a separate report. EA facilitated a fish identification training workshop for LACDPH and City of Long Beach on 8 August 2018; the results of the training will be summarized in the next reporting period.

## **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 English and Spanish speaking communities, with a smaller minority of Chinese and Austronesian communities.

During the reporting period, HTB and Cabrillo achieved the outreach objectives by reaching 11,191 and 1,765 anglers, respectively. On average, 85 percent of anglers were aware of the contamination of which 93 percent spoke English, 6 percent spoke Spanish, and 1 percent spoke Chinese. On average, 53 percent of anglers were repeat respondents and 47 percent of anglers were new respondents at the piers. HTB and Cabrillo reported anglers source of information on their awareness of the contamination (i.e., pier signs, information tip-cards, pier outreach team, internet, community events, media, friend/family, or other). Based on the results, the pier outreach team (52 percent) and pier signage (33 percent) were reported as the most influential source of information. Less influential sources of awareness were internet (5 percent), tip-cards (3 percent), media (3 percent), friends/family (2 percent), and other sources, such as school (2 percent).

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 have also shown positive effectiveness in disseminating information. A total of 4,925 tip cards were distributed in English (35 percent), Spanish (23 percent), Chinese (16 percent), and Vietnamese (26 percent). Four bait shops either went out of business or stopped selling bait and were replaced with new bait shops during the outreach events. Twenty-one community outreach events were performed by HDR (9), BPSOS (10), and CHCC (2). The outreach reporting indicated that the community events were highly

effective at reaching the target communities handing out 2,801 total tip cards at events reaching Latino, African American, Vietnamese, and Chinese communities. Of the outreach activities, electronic outreach has had the least effectiveness in reaching the communities based on the minimal traffic observed on the FCEC website and Facebook page.

## **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.

Relative to awareness, information collected could be further explored to determine details on answers provided such as the form of media the angler learned of the contamination, internet sources, how many family members and/or friends shared knowledge. With regards to the geographic distribution and demographic variability, city data could be collected in addition to the zip codes. This could help to better understand and visualize the geographic distribution of the anglers' location and outreach effectiveness. Allowing anglers to respond to the language question to give multi-or bi-lingual responses would also aide in the data collection of distribution of communities reached through outreach efforts.

The bait shop outreach identified some improvements that could benefit outreach. During the outreach, many of the plastic tip card holders were missing or needed replacement. New holders are planned for the next reporting period. Future bait shop outreach could also include increased focus on the Huntington Beach Pier and addition of a "Do Not Consume" fish sign at this pier. Due to observed turn-over rate in the grocery and liquor store industry, it is suggested that informational brochures be distributed to new cashiers, in addition to the FCEC website, as well as frequent check-ins to aid understanding of the FCEC program. Enhancements to the FCEC website and Facebook page content and organization could potentially improve the effectiveness of electronic outreach. Because the bounce rate for the FCEC website has remained above 80 percent since August 2017, it appears that users visit the website, look for resources, and leave quickly if they do not find the information. 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, pictures, outreach information, 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. Updates to the FCEC website page organization are planned during the next reporting period.

The community outreach events have been effective at distributing information materials to the target communities. HDR noted that children are attracted to the FCEC booth by the fishing game. Additional fishing games could facilitate more traffic during the events and shared with the other outreach partners that hold events (CHCC, BPSOS, City of Long Beach). The large

display board features outreach to fish markets and anglers, however, it would be worthwhile to update technical information and add information about outreach for local educators, schools and/or school districts to help attract teachers to the booth. Purchase of additional fishing games and updates to FCEC booth materials is planned during the next reporting period. BPSOS and CHCC are continuing to collaborate with other organizations in order to diversify the community events to reach more anglers in the Chinese and Vietnamese communities. It is recommended the community outreach partners continue to obtain awareness source information, particularly focusing on engaging the visitors and educating them on the reason for the data collection. It is recommended that CHCC and BPSOS work to improve sign-in at the Chinese and Vietnamese focused events during the next reporting period.

The FCEC Partners Meeting was held on 18 January 2018 for stakeholders to discuss the angler, community, and enforcement outreach activities. Some key items that resulted from the meeting include the night angler outreach pilot program, pier sign accounting, pier sign monitoring, and Los Angeles Unified School District (LAUSD) outreach contacts. The night angler outreach pilot program data was presented for the August to October 2017 pilot program period. The data indicates successful targeting of new anglers during the night outreach program, therefore the night outreach will be extended to year-round during the next reporting period. Pier sign accounting discrepancies were noted in the last reporting period by comparison of LACDPH, Cabrillo, and HTB tracking. The accounting issue was resolved and is discussed in a pier sign status report, submitted separately. Additionally, it was determined that HTB monitors 5 of the total 7 signs at Rainbow Harbor pier. The City of Long Beach agreed to begin monitoring the two signs that are not being monitored by HTB. Discussions of LAUSD outreach activities to target non-English speaking adults through their children were also discussed. Previous attempts to engage the LAUSD system have not been successful. The Department of Toxic Substance Control offered additional contacts for HDR for follow-up. HDR will continue to research new educational activities that would be amenable to outreach in the next reporting period.

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**ACRONYMS AND ABBREVIATIONS**

BPSOS	Boat People SOS
Cabrillo	Cabrillo Marine Aquarium
CCHC	Chinese Christian Herald Crusade
City of Long Beach	City of Long Beach Department of Health and Human Services, Bureau of Environmental Health
DDT	Dichlorodiphenyltrichloroethane
EA	EA Engineering, Science, and Technology, Inc.
EPA	U.S. Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
HDR	HDR, Inc.
HTB	Heal the Bay
IC	Institutional control
LACDPH	Los Angeles County Department of Public Health
LAUSD	Los Angeles Unified School District
PCB	Polychlorinated biphenyl

## 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 (DDT) and polychlorinated biphenyls (PCBs) 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 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 Interim Record of Decision 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 August 2017 and July 2018.
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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 August 2017 and July 2018.

Additionally, the City of Long Beach Department of Health and Human Services, Bureau of Environmental Health (City of Long Beach) began collection of enforcement inspection data (markets and restaurants) between July 2017 and July 2018. The enforcement activities are further documented in the Annual Enforcement Report, submitted separately.

EA will facilitate a fish identification training workshop for Los Angeles County Department of Public Health (LACDPH) and City of Long Beach on 8 August 2018, the results of this training will be summarized in the next reporting period. The pier signs were monitored by HTB, Cabrillo, LACDPH, and City of Long Beach between August 2017 and July 2018 to assess the need for replacement or repair. Pier sign condition status 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 Partners Meeting.

The following sections summarize each of these outreach subprograms.

## 2.1 ANGLER OUTREACH

HTB and Cabrillo continued the previous Angler Outreach activities. 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. From August 2017 to October 2017, HTB expanded angler outreach to include evening hours as a pilot program at Venice and Redondo Beach piers. The pilot program was implemented to reach night anglers observed at the piers. These two piers were chosen based on popularity and ease of access for the outreach team during the evening hours. The evening program (4:00 P.M.-8:00 P.M.) was performed once per week (Saturdays) for the duration of pilot program. Face-to-face conversations were held with anglers, in the angler's native tongue, when possible. Similar to daytime outreach, HTB staff discussed the contamination in fish, distributed informational materials, and recorded outreach activity results.

As part of the angler outreach program, EA worked with HTB and Cabrillo to monitor pier signs and maintain a record of their condition. EA reported missing or damaged signs to EPA and coordinated with the LACDPH and City of Long Beach 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](mailto:info@pvsfish.org)) and website (<http://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.

## 2.3 ELECTRONIC OUTREACH

Electronic outreach was completed by maintaining the FCEC website (<http://www.pvsfish.org/>), Facebook page (<https://www.facebook.com/fceccprogram/>), and disseminating electronic newsletters. EA responded to questions emailed to the FCEC information account, posted outreach photos, community event summaries, and upcoming events. 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**

CCHC 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. CCHC attended 2 Chinese community events, and BPSOS attended 10 Vietnamese community events. HDR attended 9 events including African American, Latino, Chinese, Polynesian, and non-specific community events. During the community events, outreach focused on distributing tip cards, comic books, and information pamphlets as well as having one-on-one conversations with community members to provide fish contamination and consumption education. Sign-up sheets are available for visitors to sign-up for the eNewsletter and indicate their awareness of the contamination (i.e., whether they are aware of the DDT/PCB fish contamination advisories before the community event, what is the awareness source (signs, tip-card, community event, outreach team, internet, media, friend/family, other).

## **2.5 FCEC PARTNERS MEETING**

The FCEC partners meeting included the angler outreach groups, agencies, and other entities to provide feedback and recommendations for program messaging, report on the condition of posted “Do Not Consume” pier signage, exchange information, and discuss issues related to the program. Further discussion of the key points from the 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 August 2017 to July 2018. From August 2017 to October 2018, HTB expanded the angler outreach to include evening hours as a pilot program at Venice and Redondo Beach piers. The evening program (4:00 P.M.-8:00 P.M.) was performed once per week (Saturdays) for the duration of pilot program.

For both the daytime outreach and evening pilot program, 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.
4. Whether the outreach angler is aware of the contamination.

5. Whether the outreach angler is aware of DDT and PCB contamination as opposed to another contaminant (e.g., mercury).
6. The awareness source (i.e., pier signage, information tip-cards, outreach, community events, media, internet, friend/family, or other).
7. The language spoken during the angler outreach.
8. The zip code the angler lives in, if provided.
9. 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, Spanish, Chinese) 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 bait shop outreach in August/September 2017 and May 2018. 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. During the bait shop outreach, four bait shops were removed from the list because they either went out of business or stopped selling bait. HDR reached out to potential bait shops and added five replacement shops. The bait shops that were removed and their replacements are listed in the table below. Figure 2 presents the locations of bait shops.

Removed Bait Shops	Replacement Bait Shops
Scubahaus, Santa Monica	Family Deli and Grocery, San Pedro
Vista Liquor, San Pedro	Manhattan Mart, Manhattan Beach
7 Eleven, Long Beach	7 Eleven, Huntington Beach (2)
Pete's Market, Long beach	El Don Liquor Store, Huntington Beach

### 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 provided additional data to assess outreach effectiveness.

### **3.4 COMMUNITY EVENT OUTREACH**

HDR, CHCC, and BPSOS attended a total of 21 community events. During each community event, the estimated 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 August 2017 and July 2018. The table presents the following total values: (1) total per month; (2) total in 2017; (3) total in 2018; (4) total for the outreach period; (5) total for HTB locations; and (6) total for Cabrillo locations. During the reporting period, the numeric objective of the HTB and Cabrillo outreach was to contact a minimum of 11,000 and 1,600 anglers, respectively. Based on the data, both HTB and Cabrillo achieved the outreach objectives by reaching 11,191 and 1,765 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 decreasing between October 2017 and March 2018, and generally increasing from April 2018 through July 2018. Overall peaks are shown in August 2017 and July 2018. Belmont Pier has the greatest variability, with peak anglers ranging from 119 (December 2017) to 434 (August 2017). Redondo Beach and Venice Beach locations have the next greatest variability, with angler outreach ranging from 42 (November 2017) to 304 (July 2018) and 67 (March 2018) to 229 (July 2018), respectively.

#### **4.1.2 Angler Outreach Effectiveness (Contamination Awareness)**

Angler awareness of the contamination and “Do Not Consume” warnings was collected during the outreach sessions from August 2017 to July 2018. Anglers were additionally asked about the source that they 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 Pier J had the most awareness with 89 percent of anglers aware of the contamination issues, followed by Venice Beach (87 percent), Santa Monica, Cabrillo Pier, and Rainbow Harbor (86 percent each). Angler awareness was lowest at Belmont Pier at 79 percent of anglers. Of the anglers contacted at the piers that were aware of the contamination, on average, 93 percent spoke English, 6 percent spoke Spanish, and 1 percent spoke Chinese.

Anglers were asked whether they were a new or repeat outreach respondent. Tables 3 and 4 summarize the percent of respondents who were repeat or new respondents for the outreach period. At all the fishing locations, at least 53 percent of anglers were repeat respondents and 47 percent of anglers were new respondents. Cabrillo Pier had the most repeat respondents (64 percent) while Rainbow Harbor and Santa Monica had the lowest repeat respondents (47 percent). Santa Monica and Rainbow Harbor had the most new respondents (53 percent each) while Cabrillo Pier had the least (35 percent). HTB and Cabrillo asked anglers that reported awareness of the contamination to provide the source of their information (i.e., pier signs, information tip-cards, pier outreach team, internet, community events, media, friend/family, or other). Based on the results presented in Table 5, the pier outreach team (52 percent) and pier signage (33 percent) were reported as the most influential source of information. Less influential sources of awareness were internet (5 percent), tip-cards (3 percent), media (3 percent), friends/family (2 percent), and other sources, such as school (2 percent).

#### **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 12,956 anglers reached between August 2017 and July 2018, 51 percent (6,661 anglers) provided their zip code. Of the anglers who provided their zip code, approximately 78 percent were from Los Angeles County, 9 percent from Orange County, 3 percent from San Bernardino County, and 2 percent from Riverside County. As approximately 92 percent of the angler outreach respondents were from the four surrounding counties, the analysis focused on these geographic areas.

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 with 332 respondents. 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.

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. Only responses of English, Spanish, and Chinese were reported in the data provided by HTB and Cabrillo. While the data may indicate that many of the anglers responded in English, bi- or multi-language responses may not have been recorded by the anglers. Additionally, there were instances in the data where the angler did not indicate the language spoken, resulting in missing data.



Table 6 summarizes the language distribution spoken by the anglers. The results indicate that nearly 84 percent of the respondents within Los Angeles, Orange, San Bernardino, and Riverside counties spoke English and approximately 16 percent were non-English speakers. Of the non-English speakers, approximately 15 percent of respondents were Spanish speakers, and 1 percent spoke Chinese. These results do not indicate if the English responders speak only English or if they are bi- or multi-lingual. Based on the data provided, the demographic groups that are likely effectively being reached through the Angler Outreach Program include English speaking, Spanish speaking, with a smaller minority of Chinese speaking anglers.

## 4.2 NIGHT ANGLER OUTREACH (PILOT PROGRAM)

During August through October 2017, HTB performed angler outreach during the evening hours as a pilot program at Venice and Redondo Beach piers. The evening program (4:00 P.M.-8:00 P.M.) was performed once per week (Saturdays) for the duration of pilot program. These piers were chosen based on previous observations of night anglers at these piers and night access for the angler outreach team.

Table 7 summarizes the total number of anglers contacted during the pilot program. The table presents the following total values: (1) total per month; (2) total for the program; and (3) total for each pier location. Based on the data, the pilot program reached a total of 1,107 anglers. During September pier anglers reached (452 anglers) were double the amounts compared to August (251 anglers) and October (314 anglers).

Table 8 summarizes the percent of anglers who responded that they were aware of the contamination and “Do Not Consume” warnings. On average, 78 percent of anglers reached exhibited awareness (81 percent at Venice Beach and 76 percent at Redondo Beach). Of the anglers that were aware of the contamination, on average, 95 percent spoke English, 4 percent spoke Spanish, and 1 percent spoke Chinese.

Tables 9 and 10 summarize the percent of respondents who were repeat or new respondents, respectively, for the pilot program period. An average of 24 percent of anglers were repeat and 76 percent of anglers were new respondents. Venice had 28 percent repeat respondents and Redondo Beach had 21 percent repeat responders.

Table 11 summarizes the awareness source from the night responders, pier signage (63 percent) and the pier outreach team (25 percent) are reported as the most influential source of information. Less influential sources of awareness were friends/family (8 percent), internet (2 percent) and media (1 percent).

During the night angler outreach pilot program, anglers were asked to provide the zip code where they live. Of the 1,017 anglers reached 51 percent (518 anglers) provided their zip code. Of the anglers who provided their zip code, approximately 87 percent were from Los Angeles County, 7 percent from Orange County, 1 percent from San Bernardino County, 1 percent from Riverside County. Figure 5 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 90260 with 16 respondents. 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.

Table 12 summarizes the language distribution spoken by the anglers reached during the pilot program. The results indicate that nearly 80 percent of the respondents within Los Angeles, Orange, San Bernardino, and Riverside counties spoke English and approximately 20 percent were non-English speakers. Of the non-English, approximately 74 percent of respondents were Spanish speakers and 16 percent spoke Chinese.

Due to the short duration of night outreach, a trend was not observed for the number of anglers reached during the night angler outreach pilot program. The night outreach program is anticipated to be extended to year-long outreach during the next reporting period.

### **4.3 BAIT SHOP OUTREACH**

In August-September 2017 and May 2018, 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). The bait shops were last contacted in April 2017. A total of 4,925 tip cards were distributed in English (35 percent), Spanish (23 percent), Chinese (16 percent), and Vietnamese (26 percent). Some shops only requested tip cards in specific languages based on their known clientele, other shops reported that they only require replenishment of English and Spanish cards, as the stock of Chinese and Vietnamese cards was sufficient. Some of the shop managers inquired if materials were provided in additional languages including: Korean, Cambodian, German and Swedish.

During the August-September 2017 outreach, the shops agreed to display and/or provide the tip cards to purchasers of bait or fishing licenses. Only one shop initially expressed hesitation, but after explaining the purpose, they agreed to display the tip cards. With the exception of three shops, all of the tip cards were distributed since the last visit in April 2017. The three shops had approximately five tip cards in English, Spanish, or Chinese languages left-over. Many shops requested follow-up replenishment of materials. During the May 2018 outreach, nine shops still had a sufficient amount of tip cards left over from the August/September 2017 outreach. It was observed that half of the shops display the materials near the fishing gear and bait while the other half are near the cash register. A majority of the shop managers were familiar with FCEC and quickly recognized the materials. Shops that had new employees and/or managers that were not familiar with FCEC and the tip cards were open to displaying and distributing the information.

### **4.4 ELECTRONIC OUTREACH**

Figures 6 and 7, and Table 13 summarize the Google Analytics datasets that were collectively used to quantify electronic outreach effectiveness. Based on the data, the website experienced a decrease in visitors, measured by the number of sessions or visits to the webpage, unique users, and page views between August and December 2017. During this time, the bounce rate and percent of new users to the website remained fairly constant on average of 87 percent and 96 percent, respectively. Between January 2018 and July 2018, the number of sessions, users, and

page views generally increased with peaks in February 2018 (120 users, 242 page views) and May 2018 (166 users, 200 page views). The bounce rate remained fairly constant throughout this period from a low of 82 percent in September 2017 to a peak of 97 percent in June 2018. The New Users remained at an average of 96 percent during this time period. The pages/session and average session duration data show an increase in the average session duration during September 2017 at 1 minute and 8 seconds, compared to an average of 0.24 seconds for the remainder of the reporting period. Pages per session hit a peak of 1.95 in February 2018, compared to the average of 1.28 for the duration of the reporting period. There is a slight increase in average session duration in February 2018 (0.27 seconds), and again in April 2018 (0.37 seconds) and May 2018 (0.28 seconds). 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 (63 percent of users with geographic tracking turned on and 50 percent of all visitors to the website). In California, the top five cities with visitors to the website include Los Angeles, Diego, San Francisco, Long Beach, and San Jose. Approximately 18 percent of visitors to the website were from Los Angeles (269 sessions), followed by 3 percent from San Diego (46 sessions), 2 percent from San Francisco (31 sessions), 2 percent from Long Beach (27 sessions), and 1 percent from San Jose (17 sessions).

The Facebook analytics data are presented in Figures 8 and 9. Figure 8 depicts the number of likes the Facebook page received from August 2017 to July 2018. Figure 9 presents the number of fans (users who like the Facebook page) reached and percent of users engaged during the outreach period for each post to the Facebook page in February 2018. As of July 2018, the Facebook pages has approximately 4,653 likes from fans. The Facebook page likes has had a steady decrease in overall likes throughout the year. The number of likes shows a declining at a rate trend of approximately 10 likes per month.

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 August 2017 and July 2018, there have been 20 posts to the Facebook page, with an average total fan reach of 41 and 1.5 percent engagement. Of the fans reached, on average 676 (82 percent) also liked the Facebook page, and approximately 0.6 percent were engaged with the posts. Many posts received little to no fans engaged.

#### **4.5 COMMUNITY OUTREACH**

HDR attended nine events including African American, Spanish, Chinese, Polynesian, and non-specific community events. Below is the list of community events attended by HDR during the outreach period:

1. Aquarium of the Pacific Autumn Festival (5 November 2017)
2. Cabrillo Autumn Sea Fair (19 November 2017)

3. Aquarium of the Pacific Underwater Parks Day (20 January 2018)
4. Alhambra Lunar New Year (24 February 2018)
5. Aquarium of the Pacific International Child's Festival (18 March 2018)
6. Aquarium of the Pacific Noche de Estrellas (23 March 2018)
7. Aquarium of the Pacific Earth Day (22 April 2018)
8. Heritage of Aloha Festival (19-20 May 2018)
9. Lummis Day (3 June 2018).

In total, an estimated 3,720 people attended the events. HDR was able to hand out tip cards to 34 percent of the attendees (1,265 people), of which 67 percent were English, 22 percent were Spanish, 43 percent were Chinese, and 2 percent were Vietnamese. Additional hand-outs this year included English and Spanish "What's the Catch" comic books for children, English, Spanish and Chinese informational brochures, and a curriculum guide for educators. Comic books were given to approximately 30 percent of attendees, of which 73 percent were English, and 27 percent were Spanish. Informational brochures were given to approximately 6 percent of attendees, of which 50 percent were English, 46 percent were Spanish, and 4 percent were Chinese. Curriculum guides were given to approximately 0.2 percent of attendees who identified themselves as educators.

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

1. Temple City Lunar New Year (3 February 2018)
2. Whittier Earth Day (18 April 2018).

In total, 2,600 people attended the events. CCHC distributed tip cards to approximately 35 percent of the attendees (910 people), of which 63 percent were Chinese, 33 percent were English, and 4 percent were Spanish. Informational brochures were given to 33 percent of attendees, of which 67 percent were Chinese, and 33 percent were English. Children's comic books were given to 11 percent of attendees, of which 67 percent were Chinese, and 33 percent were Spanish. The majority of the people reached were Chinese-speaking indicating 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, including one event in July 2017 that was not recorded during the previous reporting period. The events targeted primarily Vietnamese communities. Below is the list of community events attended by BPSOS during the outreach period:

1. Safety Day (20 July 2017)
2. National Night Out (1 August 2017)
3. Whole Health & Community Resource Fair (12 October 2017)
4. The USVA Tet-Festival (17 and 18 February 2018)
5. UCLA Vietnamese Community Health Winter Health Fair (4 March 2018)

6. Spring Festival (24 March 2018)
7. UCLA Vietnamese Community Health Spring Health Fair (22 April 2018)
8. Vietnamese American Cancer Foundation Community Services Fair (25 May 2018)
9. Task Family Fun & Resource (9 June 2018)
10. Westminster Safety Day (18 July 2018).

In total, 1,181 people attended the events with approximately 53 percent (626 people) receiving tip cards from BPSOS staff, of which 55 percent were Vietnamese, 31 percent were English, and 14 percent were Spanish. In addition, English language children's comic books were given to 49 percent of attendees.

The sign-in sheets were updated for visitors to indicate their awareness of the contamination (i.e., whether they are aware of the DDT/PCB fish contamination advisories before the community event, what is the awareness source [signs, tip-card, community event, outreach team, internet, media, friend/family, other]). Table 14 presents the data obtained from visitors that chose to respond at 6 of the 21 community events. Of the 16 responses, media (32%) and other (26%) were the most popular awareness sources. Pier signage, the pier outreach team, and internet (11%), friends/family and tip cards (5%), and events (0%) were less cited. "Other" sources cited included school or educational resources. The sign-in sheets were helpful but were not overly successful due to the lack of visitors interested in signing the sign-in sheets.

## **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 surpassed the outreach objective between August 2017 and July 2018. Additionally, the awareness data collected was also conclusive that the majority of anglers, especially at the more popular fishing locations were, approximately 85 percent 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. Overall, there was less variability in the languages reported during this period, as compared to the previous report. 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 more limited variety of ethnicities and cultures being reached through the outreach program, however while responses to languages may have been limited to single answers, and may not accurately reflect the demographics reached through the

program. The form of media the angler learned of the contamination is primarily through the outreach team and pier signage. This indicates continued successful implementation of the program outreach.

Although the above results were measurable from the collected data, improvement in the type of data collected is considered. The awareness source information could be further explored to determine additional information such as the form of media the angler learned of the contamination, internet sources, how many family members and/or friends shared knowledge. With regards to the geographic distribution and demographic variability, city data could be collected in addition to the zip codes. This could help to better understand and visualize the geographic distribution of the anglers' location and outreach effectiveness. Allowing anglers to respond to the language question to give multi-or bi-lingual responses would also aide in the data collection of distribution of communities reached through outreach efforts.

## 5.2 BAIT SHOP OUTREACH

Overall the August-September 2017 and March 2018 bait shop outreach events were successful. The majority of the shops distributed the information materials and were familiar with the program and the outreach staff. It was recommended to target local fish markets in addition to the bait shops to distribute tip cards and expand outreach to the target demographic in new communities and audiences. During this period, five bait shops either went out of business or stopped selling bait and were replaced with new bait shops. s.

During the outreach, items were noted for improvement of the outreach effort. Many of the plastic tip card holders were missing or needed replacement. Shops that kept the tip cards near the merchandise encountered more difficulty with the display. In many cases the tip cards had spilled onto the floor, displayed backwards, and/or languages were mixed together. Purchase of foldable plastic cardholders for future bait shop outreach, with the understanding that they will likely be thrown away or repurposed by the shops, are planned for the next reporting period.

The Huntington Beach Visitors' Center and Fishermen's Hardware, both located on Huntington pier, requested a large quantity of tip cards as compared to other piers. There seems to be less knowledge about the safe fishing in the area. Huntington Pier does not display "Do Not Consume" fish signage like the other piers. Future efforts could include increased outreach to shops in this area and addition of a DNC sign on the pier.

There are typically three types of businesses visited during outreach: liquor, grocery or specialty marine supply shops. There are four West Marine shops visited that have a strict policy that all outside materials are displayed near the bathrooms and sometimes disposed after 30 days. While these shops are frequently visited by anglers, they do not sell live bait. Additionally, the store clerks are less open to receiving education about the FCEC Program. Future outreach could consider replacing these shops with neighborhood businesses that sell live bait and would be more supportive of the outreach effort. Grocery and liquor stores have high employee turnover. Approximately 1/3 of the cashiers were new or needed explanation on the FCEC Program. Future efforts could include increased outreach to these shops, such as distribution of the

informational brochure to the new cashiers and more frequent check-ins to fill the knowledge gap.

### **5.3 ELECTRONIC OUTREACH**

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

The Google Analytics data indicate that since August 2017, 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 August 2017 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. 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 as the FCEC website. Since August 2017, 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. 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 does not appear to be 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 August 2017, it appears that users visit the website, look for resources, and quickly leave when they don't find the information 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, pictures, outreach information, 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. Updates to the FCEC website page organization are planned during the next reporting period.

### **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.

HDR noted that children are attracted to the FCEC booth by the fishing game. They often lead their parents to the FCEC booth to engage. Additional fishing games could facilitate more traffic during the events and be shared with the other outreach partners that hold events (CHCC, BPSOS, City of Long Beach). The large display board features outreach to fish markets and anglers, however, it would be worthwhile to update technical information and add information about outreach for local educators, schools and/or school districts to help attract teachers to the booth. Purchase of additional fishing games and update to FCEC booth materials is planned during the next reporting period.

BPSOS and CHCC are continuing to collaborate with other organizations in order to diversify the community events to reach more anglers in the Chinese and Vietnamese communities.

During the reporting period, sign-in sheets were revised for FCEC booth attendees to indicate whether they are aware of the DDT/PCB fish contamination advisories before the community event and what is the awareness source (signs, tip-card, community event, outreach team, internet, media, friend/family, other). It is recommended the community outreach partners continue to obtain this information, particularly focusing on engaging the visitors and educating them on the reason for the data collection. It is recommended that CHCC and BPSOS also work to improve sign-in at the Chinese and Vietnamese focused events during the next reporting period.

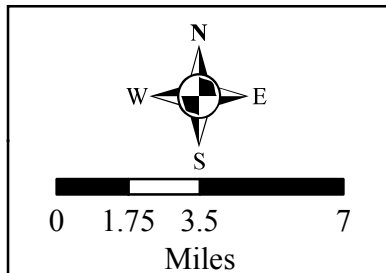
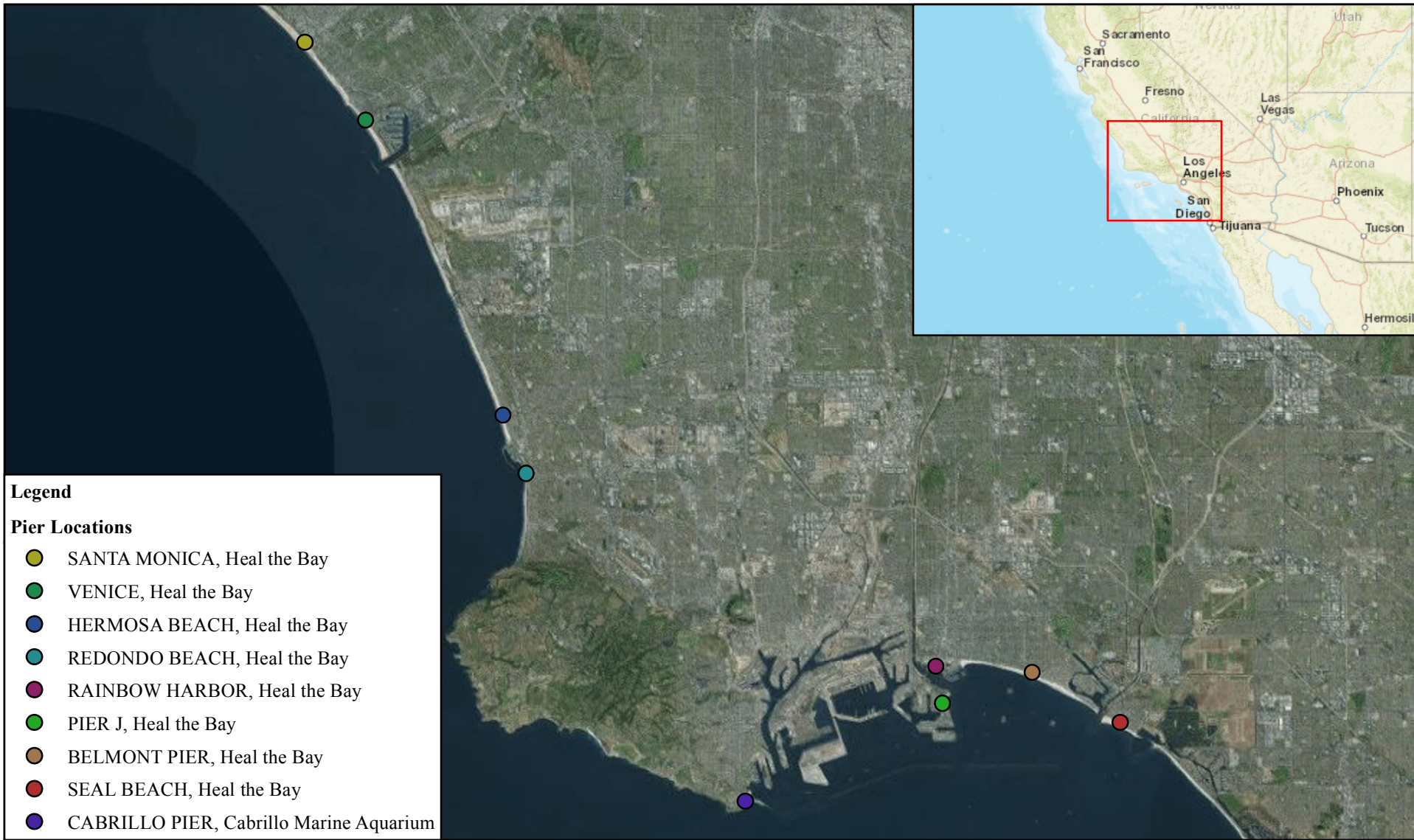
## **5.5 FCEC PARTNERS MEETINGS**

The FCEC Partners Meeting was held on 18 January 2018 for stakeholders to discuss the angler, community, and enforcement outreach activities. Some key items that resulted from the meeting include the night angler outreach pilot program, pier sign accounting, pier sign monitoring, and Los Angeles Unified School District (LAUSD) outreach contacts. The night angler outreach pilot program data was presented for the August to October 2017 pilot program period. The data indicates successful targeting of new anglers during the night outreach program. Based on the results, the night outreach will be extended to year-round during the next reporting period. Pier sign accounting discrepancies were noted in the last reporting period by comparison of LACDPH, Cabrillo, and HTB tracking. The accounting issue was resolved and is discussed in a pier sign status report, submitted separately. Additionally, it was determined that HTB monitors 5 of the total 7 signs at Rainbow Harbor pier. The City of Long Beach agreed to begin monitoring the two signs that are not being tracked by HTB. Discussions of LAUSD outreach activities to target non-English speaking adults through their children were also discussed. Previous attempts to engage the LAUSD system have not been successful. The Department of Toxic Substance Control offered additional contacts for HDR for follow-up. HDR will continue to research new educational activities that would enable to outreach through educational institutes in the next reporting period.



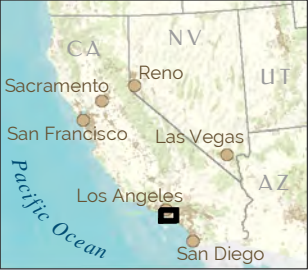
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## **FIGURES**



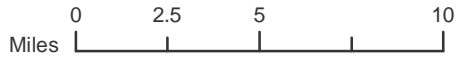
**Figure 1.** Pier Locations Map

Palos Verdes Shelf Superfund Site  
Los Angeles County, California



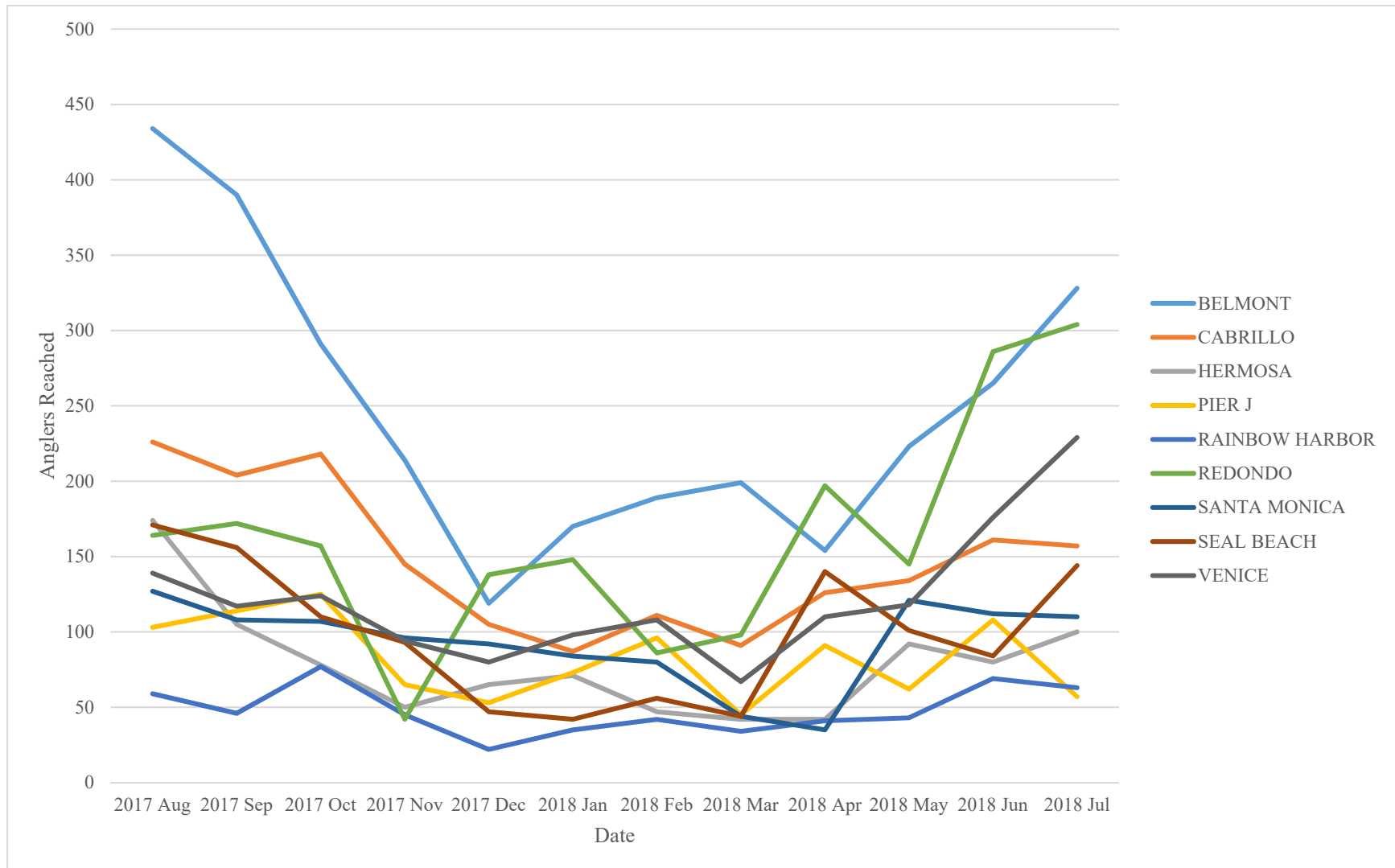
- Legend**
- Original Bait Shop Location
  - Bait Shop Added (2017/2018)
  - Bait Shop Removed (2017/2018)
  - ◆ Pier/Coastal Structure

June 2018  
 Data Sources: CSMW, 2007; esri, 2006, 2017;  
 Los Angeles County, 2016; US Census Bureau, 2016

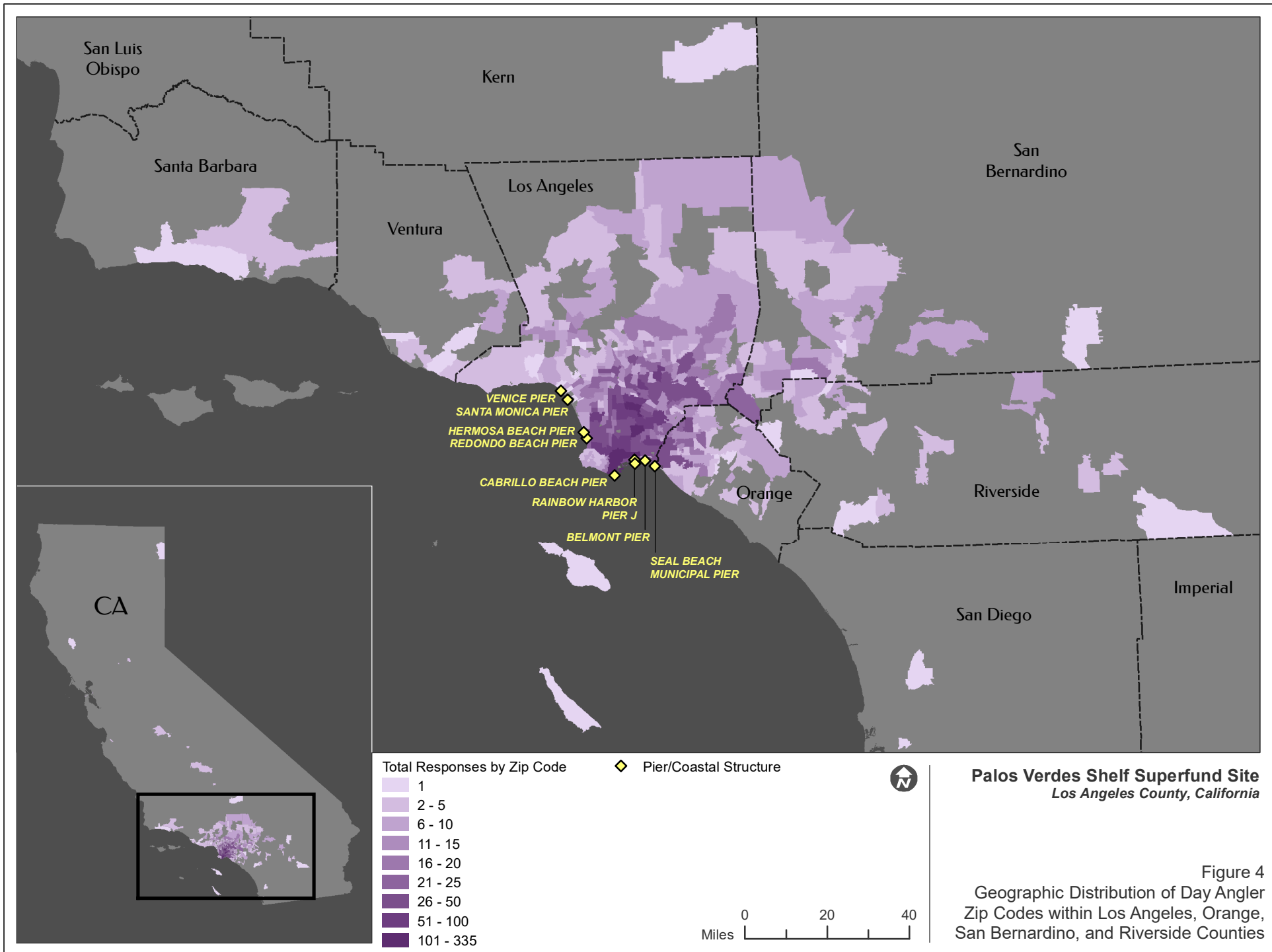


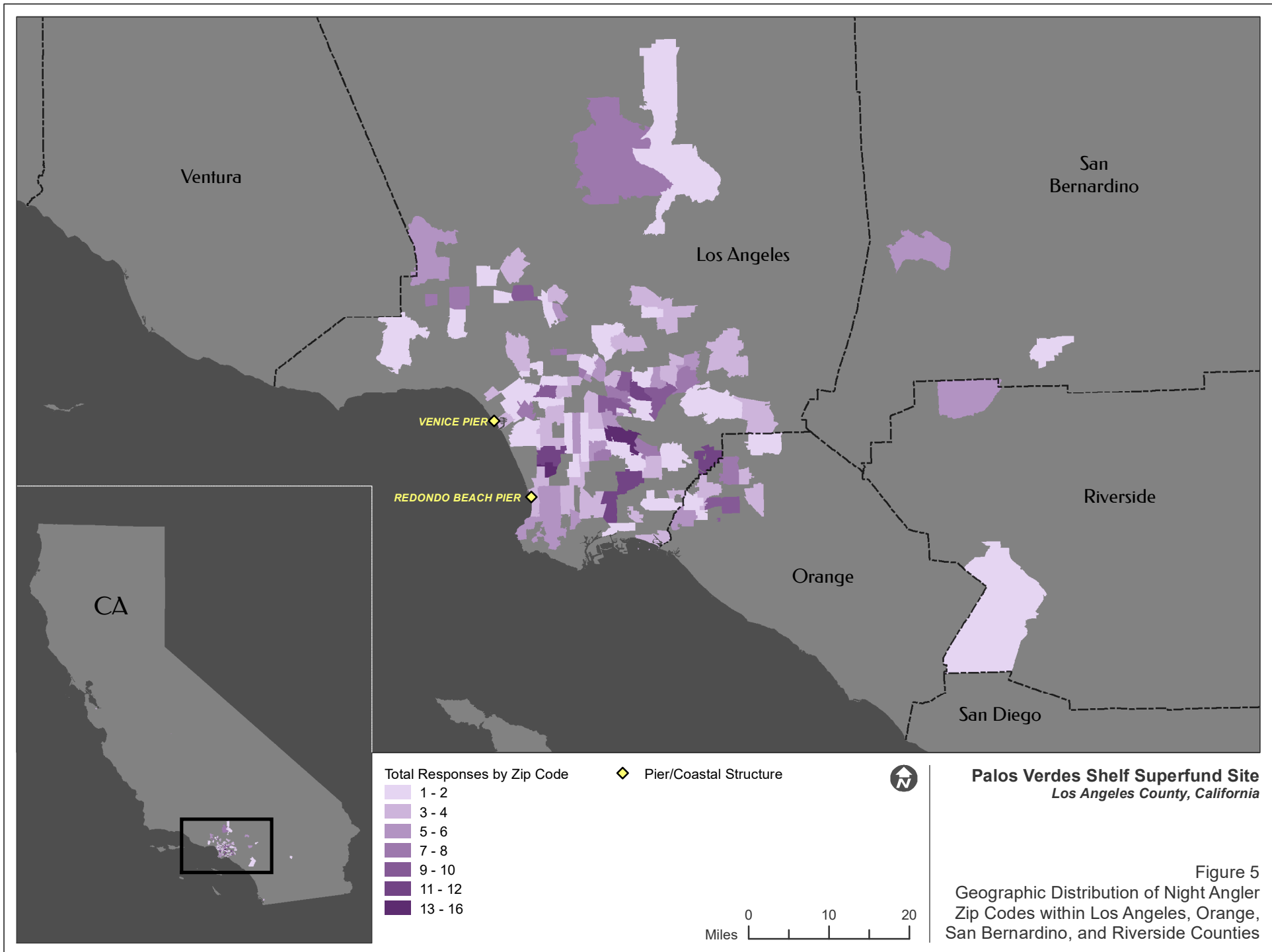
**Palos Verdes Shelf Superfund Site**  
 Los Angeles County, California

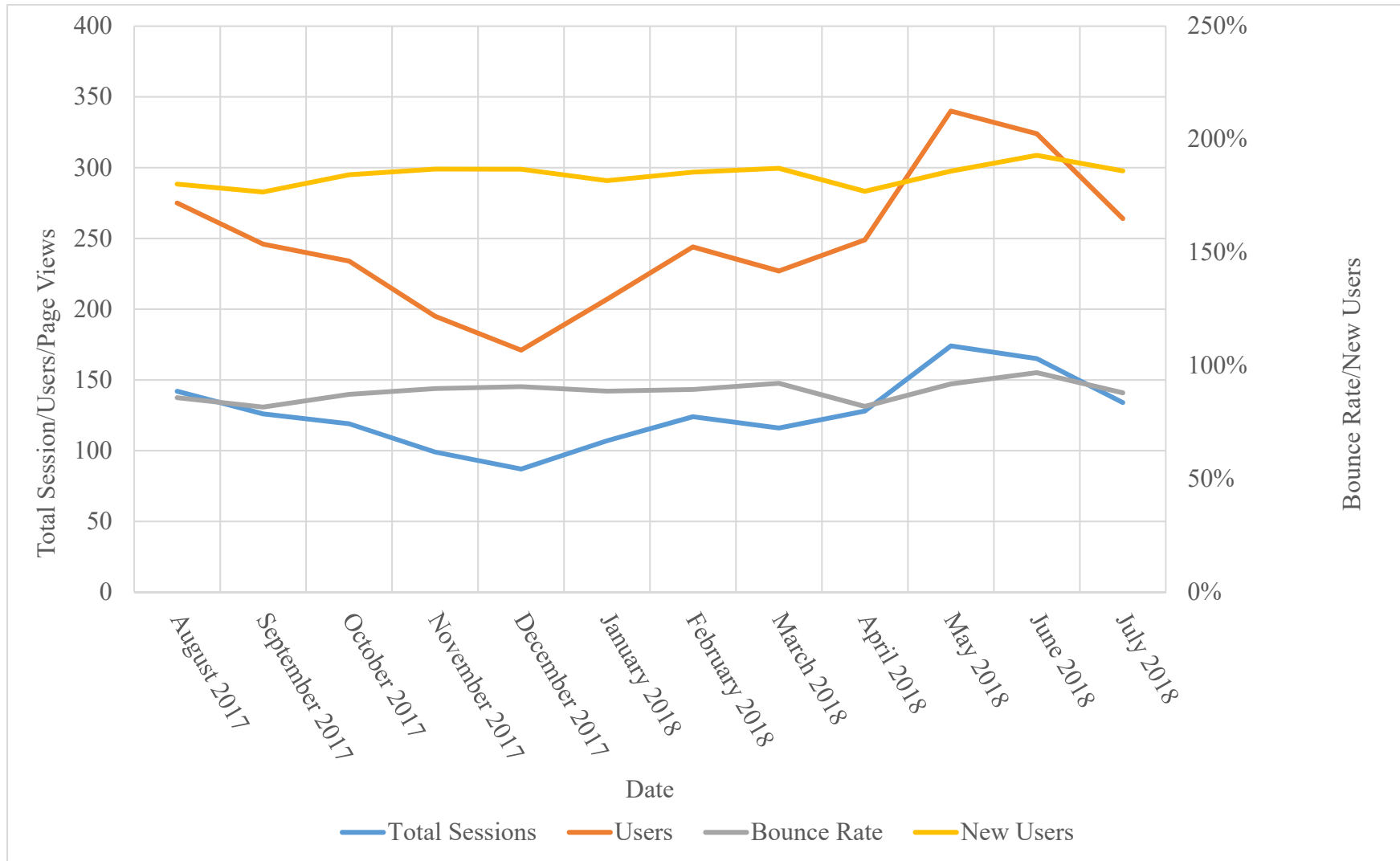
Figure 2  
 Bait Shops and Piers



**Figure 3. Seasonal Fluctuation in the Number of Anglers Contacted**

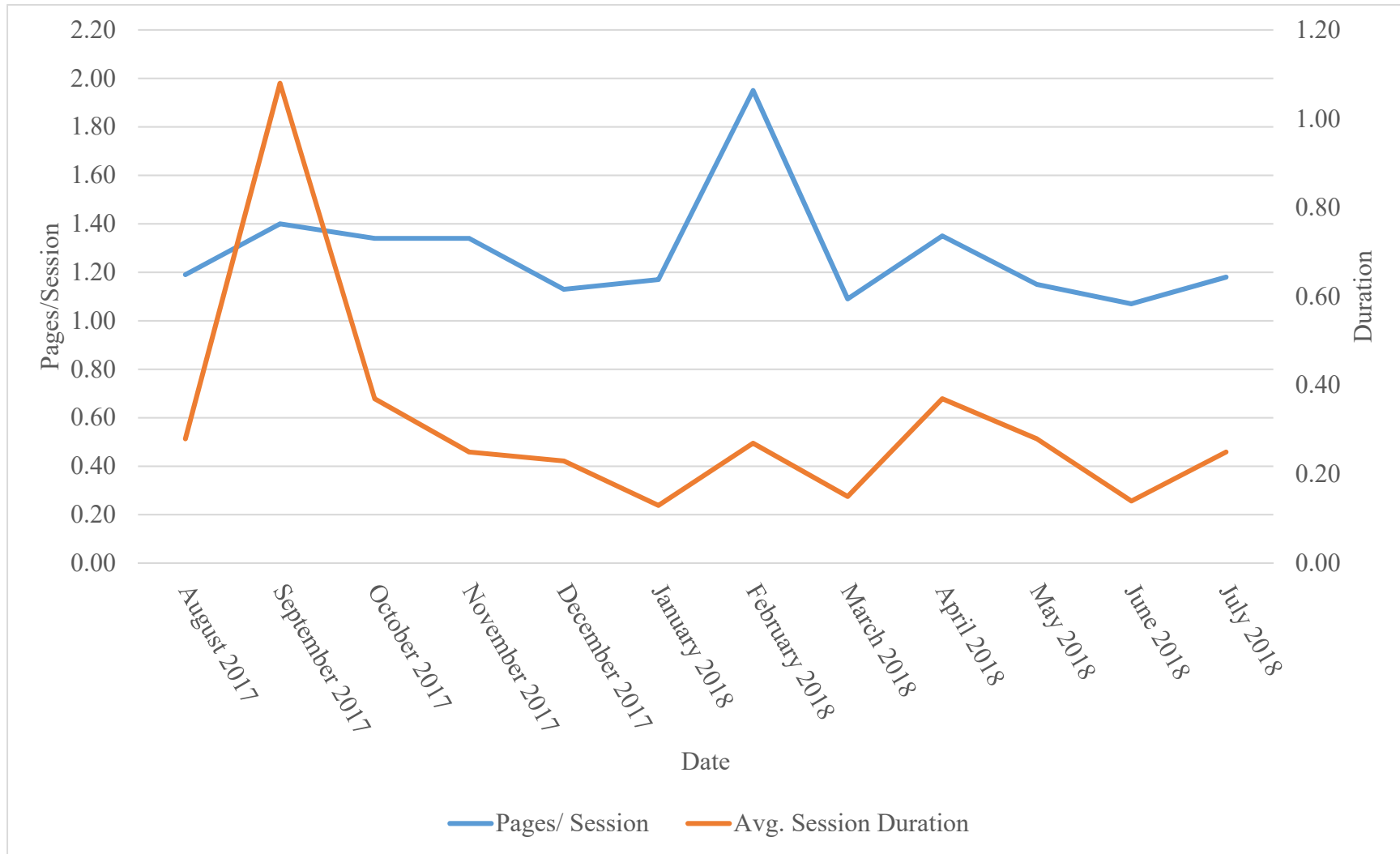




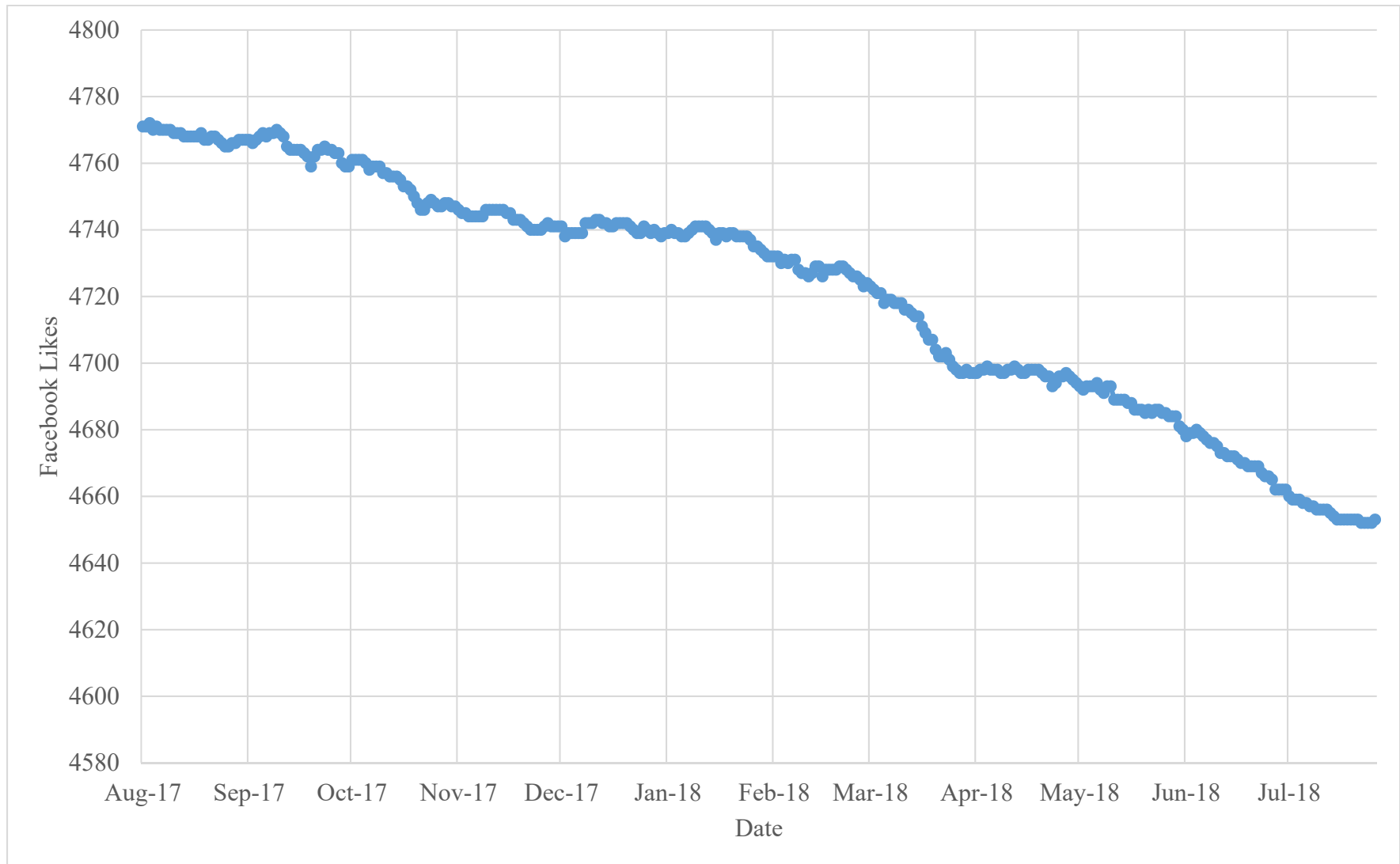


**Figure 6.** Total Sessions, Users, Page Views, Bounce Rate, and New Users

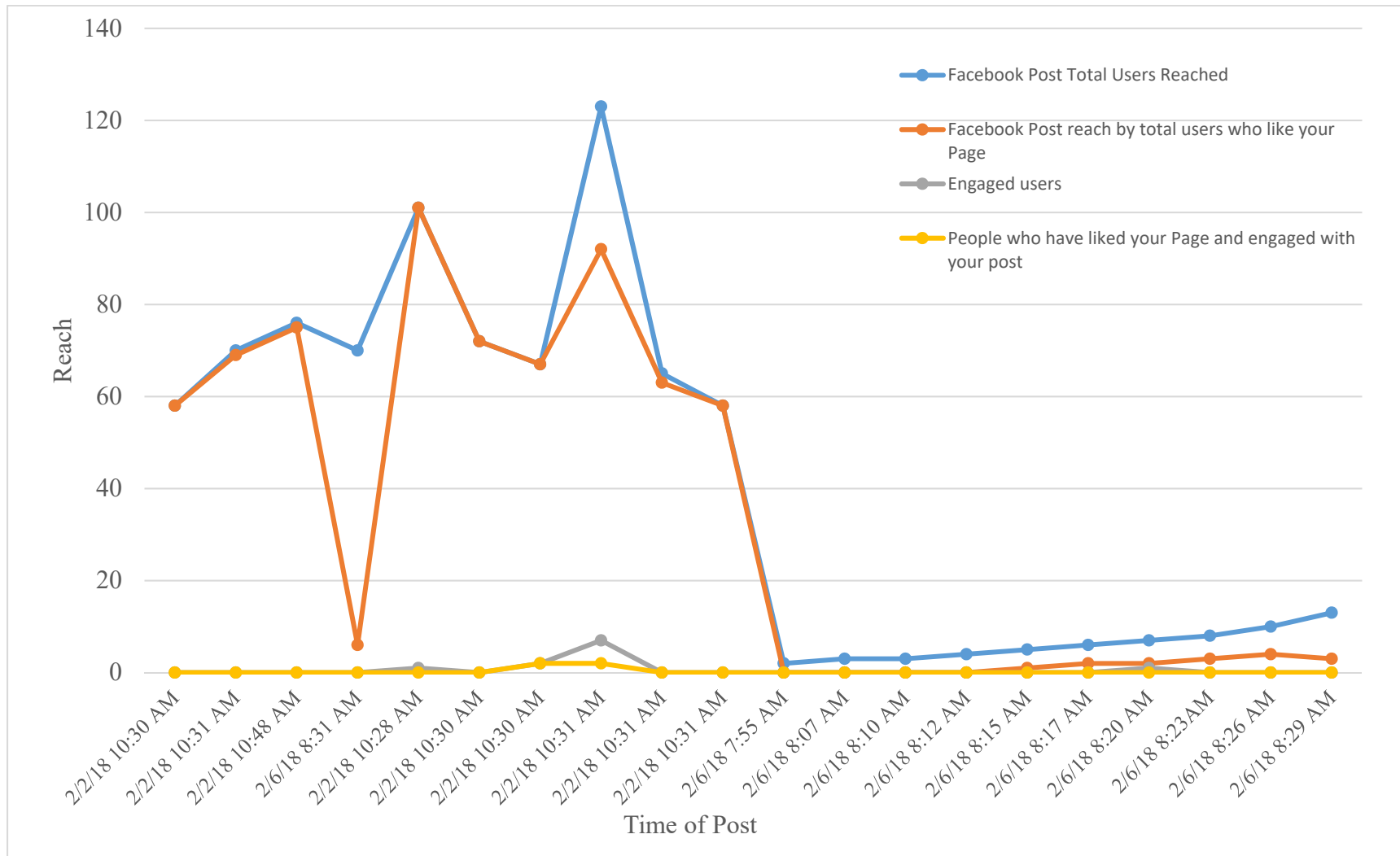




**Figure 7. Pages per Session and Average Session Duration**



**Figure 8.** Number of “Likes” Received by the FCEC Facebook Page



**Figure 9.** Total Number of Users Reached and Engaged by Posts to FCEC Facebook Page

**TABLES**

**Table 1. Anglers Contacted During Outreach Period.**

<b>Date</b>	<b>SANTA MONICA</b>	<b>VENICE</b>	<b>HERMOSA BEACH</b>	<b>REDONDO BEACH</b>	<b>RAINBOW HARBOR</b>	<b>PIER J</b>	<b>BELMONT PIER</b>	<b>SEAL BEACH</b>	<b>CABRILLO PIER</b>	<b>TOTAL</b>
Aug-2017	434	139	174	103	59	164	127	171	226	1,597
Sep-2017	390	117	105	114	46	172	108	156	204	1,412
Oct-2017	291	124	78	125	77	157	107	110	218	1,287
Nov-2017	214	94	50	65	45	42	96	93	145	844
Dec-2017	119	80	65	53	22	138	92	47	105	721
Jan-2018	170	98	71	73	35	148	84	42	87	808
Feb-2018	189	108	47	96	42	86	80	56	111	815
Mar-2018	199	67	42	45	34	98	44	44	91	664
Apr-2018	154	110	42	91	41	197	35	140	126	936
May-2018	223	118	92	62	43	145	121	101	134	1,039
Jun-2018	265	176	80	108	69	286	112	84	161	1,341
Jul-2018	328	229	100	57	63	304	110	144	157	1,492
Total (2016)	1,448	554	472	460	249	673	530	577	898	5,861
Total (2017)	1,528	906	474	532	327	1,264	586	611	867	7,095
Total (Outreach Period)	2,976	1,460	946	992	576	1,937	1,116	1,188	1,765	12,956

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

<b>Date</b>	<b>SANTA MONICA</b>	<b>VENICE</b>	<b>HERMOSA BEACH</b>	<b>REDONDO BEACH</b>	<b>RAINBOW HARBOR</b>	<b>PIER J</b>	<b>BELMONT PIER</b>	<b>SEAL BEACH</b>	<b>CABRILLO PIER</b>	<b>Average</b>
Aug-2017	80%	87%	93%	90%	95%	88%	85%	80%	83%	87%
Sep-2017	80%	87%	95%	74%	74%	88%	80%	81%	79%	82%
Oct-2017	84%	81%	73%	85%	83%	85%	90%	75%	78%	82%
Nov-2017	89%	89%	74%	91%	71%	88%	82%	63%	85%	81%
Dec-2017	93%	91%	85%	91%	100%	89%	78%	89%	90%	90%
Jan-2018	74%	83%	72%	86%	91%	90%	77%	100%	85%	84%
Feb-2018	92%	87%	83%	82%	88%	86%	73%	95%	92%	86%
Mar-2018	82%	94%	55%	76%	76%	86%	80%	89%	98%	82%
Apr-2018	95%	84%	100%	85%	95%	93%	71%	77%	81%	87%
May-2018	91%	85%	88%	66%	81%	95%	77%	86%	91%	84%
Jun-2018	88%	81%	86%	81%	87%	91%	79%	93%	83%	86%
Jul-2018	87%	79%	90%	89%	89%	88%	93%	73%	87%	86%
Average	86%	87%	82%	83%	86%	89%	79%	83%	86%	84%

**Table 3. Repeat Respondents to Angler Outreach.**

<b>Date</b>	<b>SANTA MONICA</b>	<b>VENICE</b>	<b>HERMOSA BEACH</b>	<b>REDONDO BEACH</b>	<b>RAINBOW HARBOR</b>	<b>PIER J</b>	<b>BELMONT PIER</b>	<b>SEAL BEACH</b>	<b>CABRILLO PIER</b>	<b>Average</b>
Aug-2017	30%	42%	60%	41%	32%	49%	42%	24%	47%	41%
Sep-2017	37%	42%	65%	49%	30%	60%	39%	44%	53%	47%
Oct-2017	54%	24%	45%	41%	38%	59%	46%	28%	56%	43%
Nov-2017	44%	46%	74%	54%	49%	43%	55%	35%	67%	52%
Dec-2017	40%	70%	43%	75%	41%	55%	59%	47%	74%	56%
Jan-2018	41%	64%	51%	71%	34%	55%	42%	40%	71%	52%
Feb-2018	53%	63%	70%	46%	64%	45%	48%	73%	69%	59%
Mar-2018	52%	67%	45%	60%	41%	57%	48%	45%	68%	54%
Apr-2018	53%	65%	64%	55%	78%	55%	46%	61%	65%	60%
May-2018	58%	66%	71%	40%	51%	43%	46%	76%	75%	59%
Jun-2018	51%	59%	59%	45%	55%	44%	57%	79%	68%	57%
Jul-2018	51%	50%	56%	53%	48%	50%	65%	58%	60%	55%
Average	47%	55%	59%	53%	47%	51%	49%	51%	64%	53%

**Table 4. New Respondents to Angler Outreach.**

<b>Date</b>	<b>SANTA MONICA</b>	<b>VENICE</b>	<b>HERMOSA BEACH</b>	<b>REDONDO BEACH</b>	<b>RAINBOW HARBOR</b>	<b>PIER J</b>	<b>BELMONT PIER</b>	<b>SEAL BEACH</b>	<b>CABRILLO PIER</b>	<b>AVERAGE</b>
Aug-2017	70%	58%	40%	59%	68%	51%	58%	76%	53%	59%
Sep-2017	63%	58%	35%	51%	70%	40%	61%	56%	47%	53%
Oct-2017	46%	76%	55%	59%	62%	41%	54%	72%	44%	57%
Nov-2017	56%	54%	26%	46%	51%	57%	45%	65%	34%	48%
Dec-2017	60%	30%	57%	25%	59%	45%	41%	53%	26%	44%
Jan-2018	59%	36%	49%	29%	66%	45%	58%	60%	29%	48%
Feb-2018	47%	37%	30%	54%	36%	55%	53%	27%	31%	41%
Mar-2018	48%	33%	55%	40%	59%	43%	52%	55%	31%	46%
Apr-2018	47%	35%	36%	45%	22%	45%	54%	39%	35%	40%
May-2018	42%	34%	29%	60%	49%	57%	54%	24%	25%	41%
Jun-2018	49%	41%	41%	55%	45%	56%	43%	21%	31%	42%
Jul-2018	49%	50%	44%	47%	52%	50%	35%	42%	40%	45%
Average	53%	45%	41%	47%	53%	49%	51%	49%	35%	47%



**Table 5. Source of Angler Awareness August 2017 – July 2018.**

	AWARENESS SOURCE								
	PIER SIGNAGE	TIP CARD	PIER OUTREACH TEAM	INTERNET	EVENTS	MEDIA	FRIENDS/FAMILY	OTHER	TOTAL
Belmont	984	32	1326	22	0	136	57	49	2606
Cabrillo	437	6	934	5	0	4	29	78	1493
Hermosa	204	3	550	9	0	41	6	5	818
Pier J	285	5	507	11	0	13	15	24	860
Rainbow Harbor	210	0	275	1	0	0	0	9	495
Redondo	696	14	1019	6	0	55	42	10	1842
Santa Monica	324	324	10	563	10	0	14	8	1253
Seal Beach	312	9	578	16	0	60	15	11	1001
Venice	387	0	832	8	0	35	9	35	1306
Total	3839	393	6031	641	10	344	187	229	11674
Percent (total Sources)	33%	3%	52%	5%	0%	3%	2%	2%	100%

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

<b>LANGUAGE SPOKEN</b>	<b>LOS ANGELES</b>	<b>ORANGE</b>	<b>RIVERSIDE</b>	<b>SAN BERNARDINO</b>	<b>TOTAL-NON- ENGLISH</b>
English	93%	94%	99%	98%	NA
Spanish	6%	5%	1%	2%	15%
Chinese	1%	0%	0%	0%	1%
Total	100%	100%	100%	100%	

**Table 7. Night Anglers Contacted August 2017 – October 2017.**

<b>Date</b>	<b>REDONDO</b>	<b>VENICE</b>	<b>Total</b>
Aug-2017	155	96	251
Sep-2017	258	194	452
Oct-2017	195	119	314
Total (Night Outreach)	608	409	1,017

**Table 8. Night Anglers Aware of Contamination and “Do Not Consume” Warnings.**

<b>Date</b>	<b>REDONDO</b>	<b>VENICE</b>	<b>Average</b>
Aug-2017	66%	71%	69%
Sep-2017	97%	91%	94%
Oct-2017	64%	81%	72%
Average	76%	81%	78%

**Table 9. Repeat Respondents to Night Angler Pilot Outreach.**

<b>Date</b>	<b>Redondo</b>	<b>Venice</b>	<b>Average</b>
Aug-2017	17%	22%	20%
Sep-2017	20%	26%	23%
Oct-2017	27%	36%	31%
Average	21%	28%	24%

**Table 10. New Respondents to Angler Pilot Outreach.**

<b>Date</b>	<b>Redondo</b>	<b>Venice</b>	<b>Average</b>
Aug-2017	83%	74%	79%
Sep-2017	80%	78%	79%
Oct-2017	73%	64%	69%
Average	79%	72%	76%

**Table 11. Source of Night Angler Awareness August – October 2017.**

	AWARENESS SOURCE								
	PIER SIGNAGE	TIP CARD	PIER OUTREACH TEAM	INTERNET	EVENTS	MEDIA	FRIENDS/FAMILY	OTHER	TOTAL
Redondo	364	0	123	7	0	8	48	1	551
Venice	218	0	108	14	0	3	30	1	374
Total	582	0	231	21	0	11	78	2	925
Percent (total Sources)	63%	0%	25%	2%	0%	1%	8%	0%	100%

**Table 12. Languages Spoken by Night Anglers from Los Angeles, Orange, San Bernardino, and Riverside Counties.**

<b>LANGUAGE SPOKEN</b>	<b>LOS ANGELES</b>	<b>ORANGE</b>	<b>RIVERSIDE</b>	<b>SAN BERNARDINO</b>	<b>TOTAL NON-ENGLISH</b>
English	96%	100%	14%	100%	NA
Spanish	3%	0%	71%	0%	74%
Chinese	1%	0%	14%	0%	16%
Total	100%	100%	100%	100%	



**Table 13. Summary of Google Analytics Data.**

<b>Month-YY</b>	<b>Total Sessions</b>	<b>% Change from Previous Month</b>	<b>Users</b>	<b>Page Views</b>	<b>Pages/Session</b>	<b>Avg. Session Duration Minutes</b>	<b>Bounce Rate</b>	<b>New Users</b>	<b>Returning Users</b>
August 2017	142		133	169	1.19	0.28	85.92%	94%	6%
September 2017	126	-11.27%	120	177	1.40	1.08	81.75%	95%	5%
October 2017	119	-5.56%	115	160	1.34	0.37	87.39%	97%	3%
November 2017	99	-16.81%	96	133	1.34	0.25	89.90%	97%	3%
December 2017	87	-12.12%	84	98	1.13	0.23	90.80%	96%	4%
January 2018	107	22.99%	100	125	1.17	0.13	88.79%	93%	7%
February 2018	124	15.89%	120	242	1.95	0.27	89.52%	96%	4%
March 2018	116	-6.45%	111	127	1.09	0.15	92.24%	95%	5%
April 2018	128	10.34%	121	173	1.35	0.37	82.03%	95%	5%
May 2018	174	35.94%	166	200	1.15	0.28	91.95%	94%	6%
June 2018	165	-5.17%	159	177	1.07	0.14	96.97%	96%	4%
July 2018	134	-18.79%	130	158	1.18	0.25	88.06%	98%	2%

**Table 14. Source of Community Outreach Awareness August 2017 – July 2018.**

	AWARENESS SOURCE								
	PIER SIGNAGE	TIP CARD	PIER OUTREACH TEAM	INTERNET	EVENTS	MEDIA	FRIENDS/FAMILY	OTHER	TOTAL
Aquarium of the Pacific Autumn Fair	0	0	0	0	0	0	1	1	2
Cabrillo Aquarium Sea Fair	2	1	1	0	0	0	0	0	4
Underwater Parks Day	0	0	0	0	0	0	0	4	4
Noche de Estrellas	0	0	1	0	0	0	0	0	1
Heritage of Aloha	0	0	0	1	0	0	0	0	1
Lummis Day	0	0	0	1	0	3	0	0	4
Total	2	1	2	2	0	3	1	5	16
Percent (total Sources)	11%	5%	11%	11%	0%	32%	5%	26%	100%