



Fish Contamination Education Collaborative Annual Angler Outreach Report

August 2020 – July 2021

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

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ACRONYMS AND ABBREVIATIONS

BPSOS	Boat People SOS
Cabrillo	Cabrillo Marine Aquarium
CCHC	Chinese Christian Herald Crusade
CDFW	California Department of Fish and Wildlife
City of Long Beach	City of Long Beach Department of Health and Human Services, Bureau of Environmental Health
DBS&A	Daniel B. Stephens & Associates, Inc.
DDT	Dichloro-diphenyl-trichloroethane
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
HSP	Health and Safety Plan
IC	Institutional control
LACDPH	Los Angeles County Department of Public Health
PCB	Polychlorinated biphenyl
PPE	Personal protective equipment
QR	Quick response

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 (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.

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. EA has 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. In November 2020, team subcontractor Daniel B. Stephens & Associates, Inc. (DBS&A), took over the bait shop and community event outreach activities that HDR had been performing. EA managed electronic outreach through the Fish Contamination Education Collaborative (FCEC) website.

SUMMARY OF COMMUNITY INVOLVEMENT PROGRAM

The purpose of the Community Involvement Program is to disseminate educational material concerning consumption of contaminated fish with a focus on vulnerable ethnic communities. The Community Involvement Program was designed to reduce risk posed by exposure to 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.

In March 2020, the World Health Organization classified the COVID-19 outbreak as a pandemic. To reduce the impact of the outbreak, closures of non-essential businesses and restrictions on public gatherings were issued by the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention, the State of California, and Los Angeles County. Therefore, in-person angler and community outreach events were suspended in mid-March 2020 in compliance with State restrictions and closures of public spaces. The restrictions and closures continued into this reporting period.

HTB resumed pier angler outreach in June 2021. Cabrillo did not perform angler outreach during this reporting period. In addition, HDR, DBS&A, BPSOS, and CCHC did not perform community event outreach. HDR and DBS&A performed modified bait shop outreach to limit in-person contact.

EA typically facilitates a fish identification training workshop for Los Angeles County Department of Public Health (LACDPH). Additionally, EA coordinates an annual FCEC partners meeting. These events had been planned for April 2020 but, due to the COVID-19 pandemic, it was not rescheduled during this reporting period.

The City of Long Beach Department of Health and Human Services, Bureau of Environmental Health (City of Long Beach) typically attends community outreach events, the fish identification training workshop, monitoring of “Do Not Consume” fish pier signs, and enforcement inspections of local fish markets and restaurants. The City of Long Beach decided not to continue participating in the FCEC Program. Therefore, the City of Long Beach did not perform these activities on behalf of EPA during this reporting period.

To continue EPA’s outreach and education to impacted communities during the COVID-19 pandemic, EA worked with the outreach groups to develop modifications and/or alternative methods to perform outreach activities that complied with COVID-19 guidelines and that received EPA approval. Additionally, EA worked with the angler and community event outreach groups to prepare a Health and Safety Plan (HSP) to resume outreach activities safely in accordance with the local, State, and Federal guidelines.

This report summarizes the extent of the outreach between August 2020 and July 2021, which included:

- Angler outreach conducted in June and July 2021.
- Bait shop outreach conducted in August and October 2020 and July 2021.
- Electronic outreach on the FCEC website and Facebook fan page conducted between August 2020 and July 2021.
- Alternative outreach activities performed during the COVID-19 pandemic.
- HTB
 - Map and analysis of top angler zip codes between August and December 2020.
 - Data Quality Assurance Plan and protocols between August and December 2020.
 - Educational presentations about the FCEC Angler Outreach Program during August through December 2020.

- Electronic outreach via HTB’s website and social media between August 2020 and May 2021.
- Curriculum for pilot of virtual HTB Aquarium school field trips between March and May 2021.
- Pilot opening of HTB Aquarium patio between March and May 2021.
- Pier sign monitoring in June 2021 (reported separately).
- BPSOS
 - Vietnamese translation of FCEC outreach materials in September 2020.
 - Electronic outreach via BPSOS website and social media in October 2020.
- HSP for pier angler and community outreach between April and July 2021.

Enforcement and “Do Not Consume” fish pier sign monitoring activities are also performed as part of the Community Involvement Program. LACDPH, HTB, and Cabrillo typically perform pier sign monitoring activities to assess the need for sign replacement or repair. During this reporting period, pier sign monitoring activities were limited and were only conducted by HTB in June 2021. Because LACDPH was occupied with COVID-19 public health activities, HTB performed a pier sign monitoring event at all of the piers to assess their condition. The California Department of Fish and Wildlife (CDFW) performs enforcement inspections for recreational and commercial fishing. Additionally, the LACDPH typically perform enforcement inspections of local fish markets and restaurants. During this reporting period, only CDFW performed enforcement inspections. The pier signs inspection and enforcement activities are documented separately in the Annual Pier Sign Summary Report and Annual Enforcement Report.

PROGRAM EFFECTIVENESS

The Community Involvement Program, through the various outreach activities at multiple locations, has historically been effective in reaching anglers and community members to increase awareness of the contamination issues associated with the Palos Verdes Shelf Superfund Site. However, due to the COVID-19 pandemic and local, state, and/or federal restrictions on public gatherings, the program was limited in its ability to perform outreach activities during this reporting period. Therefore, there were no in-person community events and angler outreach was suspended until June 2021. During this reporting period, the community and angler outreach was predominantly electronic, which was not as effective as in-person outreach has been in prior years.

In June and July 2021, HTB resumed angler outreach. During this period, HTB reached 1,012 anglers during daytime outreach and 176 anglers during night outreach. On average, 55 percent of day anglers were aware of the contamination, of which 96.4 percent spoke English, 3.1 percent spoke Spanish, and 0.5 percent spoke Chinese. During night outreach, 60 percent of anglers were aware of the contamination, of which 95.5 percent spoke English and 4.5 percent spoke Chinese. HTB reported the anglers’ source of information for 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 signage (40.8 percent) and tip-cards (33.2 percent) were the most influential sources of information during daytime outreach. The pier outreach team was the third highest reported outreach source (13.8 percent), a decrease from the previous reporting period (57.9 percent). Less influential sources of awareness that were reported were media (9.9 percent), friends/family (0.6 percent), and other sources (1.6 percent).

Modified bait shop outreach was conducted at 43 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. Bait shop outreach has shown positive effectiveness in disseminating information. In July 2021, a total of 3,225 tip-cards were distributed to 33 shops in English (43.4 percent), Spanish (39.5 percent), Chinese (7.8 percent), and Vietnamese (9.3 percent). The majority of shops remembered the FCEC program and most of the outreach materials were distributed. No bait shops were replaced during this reporting period; however, three bait shops were reported to be out of business in July 2021. One replacement shop was identified, and outreach material will be delivered during the next reporting period. This will bring the total to 40 bait shops, which is the number routinely targeted for outreach. Overall, the identification and tracking of bait shop turn-over continues to be effective.

Of the outreach activities, electronic outreach has historically been the least effective in reaching the communities based on the minimal traffic observed on the FCEC website and Facebook fan page. The Facebook fan page saw similar limited traffic during this reporting period. However, the FCEC website experienced a sustained increase in the number of users who visited the site (9,650 total users) compared to the previous reporting period (1,535 total users). The website also had a decrease in the average bounce rate, with 64.2 percent during this reporting period compared to 87.7 percent during the previous reporting period.

Alternative electronic outreach activities performed by HTB and BPSOS had varying success. BPSOS successfully translated a number of FCEC outreach materials into Vietnamese and posted the materials to their website, which was linked from the FCEC website. Similarly, HTB's blogs and webinars were posted on their website, were linked from the FCEC website, and were promoted through social media pages. These efforts were somewhat successful in engaging people during the pandemic. However, the other alternative electronic outreach, virtual educational presentations and virtual aquarium school field trip, were less successful. This may be due to shifts in school schedules (hybrid in-person/virtual curriculum) because of COVID-19, reduced focus on extra-curricular activities, and because the school year was ending. Based on these results, the FCEC website increased its effectiveness reaching the public. One reason may be the FCEC website updates completed in May 2020. Other reasons may be the increased traffic on the piers during COVID-19 and increased promotion of electronic outreach through partners' social media.

HTB opened their aquarium patio to the public in March 2021 with a "soft opening" or pilot. The patio featured posters with FCEC angler outreach program information and a poster showing the

“Do Not Consume” fish with QR codes that linked to HTB’s blog and the FCEC tip-cards in English, Spanish, Vietnamese, and Chinese. Physical tip-cards in English, Spanish, Vietnamese, and Chinese were also displayed. A total of 4,212 people visited the aquarium patio, with a steady increase in visitors between March and April. A total of seven QR scans were completed during the pilot period.

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. Due to the start of the COVID-19 pandemic in mid-March 2020, the dataset for this reporting period is less than the previous years’ and should be noted for comparison to historical trends.

Overall, the variability in the languages reported is consistent with the previous four reporting periods (2016-2019), which was less variability in language compared to 2015-2016 reporting. While English is the primary language spoken during both the day and evening angler outreach, more Spanish speakers were observed during the day while more Chinese speakers were observed during the night. This is opposite of the results recorded during the pilot night angler program in 2017, which indicated more Spanish than Chinese language speaking anglers. Continued monitoring of the night angler languages over future reporting periods is recommended to get a better understanding of this trend. It was also noted that awareness in the Chinese speaking community was the lowest among the three groups during daytime outreach (33 percent), but was highest during night outreach (88 percent), though the sample size is small.

During the modified bait shop outreach, 37 shops required additional outreach material during the reporting period. It is recommended to monitor bait shops that were not in need of outreach materials to evaluate whether they need replacement by more popular locations in the area. No bait shops were replaced during this reporting period; however, 3 bait shops were reported to be out of business in July 2021. One replacement shop was identified for replacement during the next reporting period. This will bring the total to 40 bait shops, which is the amount routinely targeted for outreach. During previous reporting periods, Korean outreach materials were requested in four areas (San Pedro, Long Beach, Seal Beach, and Huntington Beach). This represents a growing trend of Korean speaking anglers in multiple locations. It is recommended in the next reporting period to follow-up with the bait shops and evaluate printing and distributing bait shop outreach materials in Korean to reach this community. Additionally, it was previously recommended to assess whether the West Marine stores should be replaced with smaller community-based bait shops. West Marine is a large specialty store devoted to boating, and not all locations sell bait. Large shops like West Marine also have more employee turnover and therefore needed more time spent explaining the program and the importance of educating the public of the health risks. Of West Marine’s clientele that fish, a large majority do so offshore, outside of the red and yellow zones. Additionally, the West Marine stores require the Palos Verdes materials to be stored near their information board, located in the back of the store, away from the bait freezer.

In-person community outreach events ceased in March 2020 and did not resume during this reporting period. HTB performed a limited “soft opening” or pilot of their aquarium patio to the

public on Saturdays between March and May 2021. While the aquarium visitors increased over the time period, the QR scans were relatively low compared to the number of visitors at the aquarium. Therefore, this mode of outreach does not appear to be effective and is not recommended to be continued. Once in-person community outreach is resumed, it is recommended that community outreach partners continue to collaborate with other organizations and increase participation in order to diversify the community events and reach more anglers in the Los Angeles area, including Spanish, Chinese, and Vietnamese communities. It is also recommended to encourage community event attendees to use the sign-in sheets to indicate whether they are aware of the DDT/PCB fish contamination advisories and what is the awareness source (signs, tip-card, community event, outreach team, internet, media, friend/family, other).

Electronic outreach results show that the FCEC Facebook has not been an effective outreach mode. These results are similar to previous reporting periods. However, as a result of enhancements to the FCEC website, which were completed at the end of the previous reporting period (May 2020), outreach via the FCEC website improved compared to previous reporting periods. Other social media pages such as Instagram and Twitter, appear to be more popular and effective at reaching the public. It is recommended to continue the increased partner engagement and maintenance on the FCEC website and social media pages to improve electronic outreach.

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There remains a need to continue outreach education to pier anglers and the local community. It is recommended that the partners continue routine angler and community outreach activities when the public restrictions are lifted. Some activities may still be performed without in-person contact such as electronic outreach and virtual meetings. Once the public restrictions are lifted, the FCEC Partners meeting and Fish Identification training should be scheduled to regroup and train partners so that they may resume outreach.

1. 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 the Palos Verdes Shelf. The ICs program includes: public education and outreach, monitoring, and 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 the interim remedy of 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.

The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities. EPA designed the Community Involvement Program to reduce risk posed by exposure to contaminated fish through outreach and education. The program has three main activities: Angler Outreach, Community Outreach, and Enforcement. In support of these activities, EA Engineering, Science, and Technology, Inc. (EA) coordinated meetings with the FCEC. The FCEC is a forum for the agencies, outreach groups, and other involved entities to share ideas, get updates on the project's progress, and maintain momentum for continued outreach work.

In February 2015, EPA contracted 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. EA subcontracted Heal the Bay (HTB) and Cabrillo Marine Aquarium (Cabrillo) to perform angler outreach; Chinese Christian Herald Crusade (CCHC) and Boat People SOS (BPSOS) to conduct outreach during community events for the Chinese and Vietnamese communities, respectively; and team subcontractor, HDR, Inc. (HDR), to complete the bait shop outreach and attend community events. In

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To continue EPA's outreach and education efforts to impacted communities during the COVID-19 pandemic, EA worked with the outreach groups to develop modifications and/or alternatives to perform outreach activities that complied with COVID-19 guidelines and received EPA approval. Additionally, EA worked with the angler and community event outreach groups to prepare a Health and Safety Plan (HSP) to resume outreach activities safely and in accordance with the local, State, and Federal guidelines.

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 - Electronic outreach via BPSOS website and social media in October 2020.
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Enforcement and “Do Not Consume” fish pier sign monitoring activities are also performed as part of the Community Involvement Program. LACDPH, City of Long Beach, HTB, and Cabrillo typically perform the pier sign monitoring activities to assess the need for sign replacement or repair. During this reporting period, pier sign monitoring activities were limited and were only conducted by HTB in June 2021. Because LACDPH and City of Long Beach were occupied with COVID-19 public health activities, HTB performed a pier sign monitoring event at all of the piers to assess the condition of the signs. The California Department of Fish and Wildlife (CDFW) performs enforcement inspections for recreational and commercial fishing. Additionally, LACDPH typically perform enforcement inspections of local fish markets and restaurants. During this reporting period, only CDFW performed enforcement inspections. The pier sign inspection and enforcement activities are documented separately in the Annual Pier Sign Summary Report and Annual Enforcement Report.

2. OVERVIEW OF THE COMMUNITY INVOLVEMENT PROGRAM

The Community Involvement Program is one of three ICs designed to reduce risk 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 with a focus on vulnerable ethnic communities. This report summarizes the extent of the outreach including:

- Angler Outreach.
- Bait Shop Outreach.
- Electronic Outreach.
- Community Event Outreach.
- FCEC Partners Meeting.

The following sections summarize each of these outreach subprograms.

2.1 ANGLER OUTREACH

HTB and Cabrillo conduct angler outreach during the day at nine fishing piers located within the Palos Verdes Shelf Superfund Site contaminated sediment area between Santa Monica Pier and Seal Beach Pier (Figure 1). HTB performs angler outreach at 8 of the piers including (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 performs day angler outreach at Cabrillo pier. The angler outreach staff educate anglers at the piers about the local contamination and distribute FCEC program materials two to three days per week, generally during the day and at times of highest angler population on the pier (Thursday or Friday, Saturday, and Sunday). HTB expanded the angler outreach program to include evening hours as a pilot program at Venice and Redondo Beach piers between August 2017 and October 2017. These two piers were chosen based on popularity and ease of access for the outreach team during the evening hours. HTB conducted evening outreach on Saturdays between 4:00 and 8:00 P.M. Based on the success of the pilot program, evening outreach at these piers was implemented in October 2018.

Due to the COVID-19 pandemic, the angler outreach activities were suspended in mid-March 2020. HTB resumed day and evening outreach activities in June 2021. Cabrillo did not resume angler outreach during this reporting period.

During April and May 2021, EA worked with HTB to prepare a HSP for safely resuming angler outreach in accordance with local, state, and federal COVID-19 guidelines. The EPA-approved HSP outlined safety modifications to angler outreach activities including personal protective equipment (PPE), sanitation, and social distancing requirements. In June and July 2021, HTB performed day angler outreach at seven of the piers because Venice Beach pier was closed for renovations. Similarly, night outreach was performed at Redondo Beach pier, only.

While in-person outreach was suspended between August 2020 and May 2021, HTB performed alternative outreach activities that did not involve staff being in direct contact with the public on the piers. The alternative activities are bulleted below and further discussed in Section 3.1.

- Map and analysis of top angler zip codes.
- Data Quality Assurance Plan and protocols.
- Educational presentations about the FCEC Angler Outreach Program.
- Electronic outreach blogs and “Knowledge Drop” webinars.
- Curriculum for pilot of virtual HTB Aquarium school field trips.
- Pilot opening of the HTB Aquarium patio.

2.2 BAIT SHOP OUTREACH

Two rounds of bait shop outreach are performed at a minimum of 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). The bait shops are provided with FCEC outreach materials (tip-cards in English, Spanish, Vietnamese, and Chinese). Additionally, the FCEC contact email address (info@pvsfish.org) and website (<http://pvsfish.org/>) is given to bait shops so they may request additional materials or ask questions.

Due to COVID-19, HDR and DBS&A performed modified bait shop outreach that included telephone interviews to 43 bait shops and no-contact delivery of FCEC outreach materials. The first round of bait shop outreach was performed by HDR in August and October 2020. DBS&A took over HDR’s outreach responsibilities and performed the second round of bait shop outreach in July 2021.

2.3 ELECTRONIC OUTREACH

Electronic outreach was completed by maintaining the FCEC website (<http://www.pvsfish.org/>) and Facebook fan page (<https://www.facebook.com/fceccprogram/>). Typically, EA also prepares an electronic newsletter summarizing community events throughout the year. However, due to COVID-19, community outreach events were not conducted. Additionally, EA responds to questions emailed to the FCEC information account and posts FCEC reports on the FCEC website. EA recorded user traffic such as the number of visitors and Facebook fan page “likes” (using Facebook Insights). The data collected (using Google Analytics) on the FCEC website included the number of visitors, page views, number of pages viewed per session, average duration of visitor stay on the website, the bounce rate (i.e., 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.

As discussed in Section 2.2, HTB performed electronic outreach during the reporting period to increase public awareness of the fish contamination. HTB created monthly blogs and “Knowledge Drop” webinars in English and Spanish languages and posted them on HTB’s website (www.healthebay.org), which could also be accessed through the FCEC website. HTB promoted the webinars and blogs through social media postings on HTB’s Twitter (<https://twitter.com/HealTheBay/>), Instagram (<https://www.instagram.com/healthebay/>), and Facebook (<https://www.facebook.com/HealtheBay>) accounts between August 2020 and May 2021. The blogs and webinars were focused on educational topics about the FCEC angler

outreach program and fish contamination. HTB's additional electronic outreach activities included preparation of educational presentations in Spanish and English to provide virtual lectures on fish contamination and a curriculum for virtual Aquarium school field trips (Section 3.1).

BPSOS also performed electronic outreach activities. BPSOS translated FCEC outreach materials into Vietnamese, posted them on the BPSOS website (<https://www.bpsos.org/>), and promoted the materials through Instagram (<https://www.instagram.com/bpsoscca/>) and Facebook (<https://www.facebook.com/BPSOSCCA>).

2.4 COMMUNITY EVENT OUTREACH

HDR, DBS&A, CCHC, and BPSOS typically attend community outreach events and provide FCEC outreach materials. Community outreach is provided to educate these specific communities on the fish contamination and "Do Not Consume" fish. During the events, outreach focuses on distributing informational tip-cards, comic books, and pamphlets as well as having one-on-one conversations with community members to provide fish contamination and consumption education. A children's fishing game is provided at the events as a tool for children and families to engage in learning about identification of contaminated fish species. Sign-up sheets are available for visitors to sign-up for the electronic newsletter and indicate their awareness of the contamination (i.e., whether they are aware of the DDT/PCB fish contamination advisories before the community event, and what is the awareness source [i.e., "Do Not Consume" fish signs, tip-card, community event, outreach team, internet, media, friend/family, or other]).

Due to the COVID-19 pandemic, there were no community outreach events during this reporting period. As discussed in Section 2.3, BPSOS performed alternative electronic community outreach activities.

2.5 FCEC PARTNERS MEETING

The FCEC partners meeting is typically held annually in Long Beach, California. The meeting includes 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 any issues related to the program. The annual FCEC partner meeting was planned for April 2020 but was not rescheduled during this reporting period due to the COVID-19 pandemic.

3. DATA COLLECTION AND ANALYSIS APPROACH

3.1 ANGLER OUTREACH

Due to the COVID-19 pandemic, in-person angler outreach was suspended in mid-March 2020 for both the daytime and evening outreach programs. HTB staff resumed angler outreach in accordance with the EPA-approved HSP in June 2021 and collected data in June and July. Cabrillo did not perform angler outreach during this reporting period. The following data were recorded during HTB's angler outreach efforts:

- Whether an outreach angler was an adult or child.
- Whether an outreach angler was a repeat or new respondent.
- Whether a contacted angler agreed to speak with the outreach team.
- Whether the outreach angler is aware of the contamination.
- The awareness source (i.e., pier signage, information tip-cards, outreach, community events, media, internet, friend/family, or other).
- The language spoken during the angler outreach.
- The zip code the angler lives in, if provided.

Any additional notes about the angler, such as type of fish caught, and other language(s) spoken if outreach was conducted in English.

HTB's outreach data were analyzed to determine the effectiveness of the angler outreach activities. The overall outreach effectiveness was based on the percent of anglers reached who were aware of the fish contamination. 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.

As mentioned in Section 2.1, HTB performed the following alternative outreach activities between August 2020 and May 2021 that did not involve staff being in direct contact with the public on the piers.

- **Map and analysis of top angler zip codes (August through December 2020)**—HTB used 2018 and 2019 angler zip code data from FCEC Education Tally Sheets to assess the overall distribution of pier anglers. HTB created a heat map to analyze the geographic make-up of the pier angling community in and around Los Angeles County. Separately, HTB compiled 2018 and 2019 zip code information and created a heat map of

communities HTB reached by their outreach programs. The zip codes were obtained from school field trips to the HTB Aquarium, venues where HTB gave Speakers Bureau lectures, and at events where HTB “Street Fleet” (mobile outreach) tabled. The heat maps were compared to determine where pier anglers are mainly from and whether there was overlap and opportunities for expanded community outreach by HTB as part of their other outreach programs or other FCEC partners.

- **Data quality assurance plan and protocols (August through December 2020)**—HTB updated and documented their protocols for training, field data collection, and data entry. They revised their internal Excel database to streamline data entry and analysis. HTB also prepared a Quality Assurance Project Plan, which outlines the procedures the angler outreach team uses to ensure the data collected meet the project objectives. The documents were prepared by HTB’s Angler Outreach Manager with internal review and feedback from the HTB Science and Policy staff and Director.
- **Educational Presentations about the FCEC Angler Outreach Program (August 2020 through May 2021)**—HTB’s Speakers Bureau prepared presentations in English and Spanish about the FCEC Angler Outreach Program and safe fish consumption. The presentations are flexible/modular versions of the same talk for different lengths and audiences (e.g., 10 minutes, 1 hour lecture, child and adult versions). The presentations were developed for potential virtual outreach meetings with community groups in top angler zip codes. HTB researched potential community groups in the top angler zip codes for the presentation. HTB added the FCEC angler outreach program presentation to their Speakers Bureau website request form so that groups may request a speaker. The presentations were also promoted through HTB’s website and social media.
- **Electronic Outreach blogs and “Knowledge Drop” webinars (August 2020 through May 2021)**—HTB created monthly blogs and “Knowledge Drop” webinars in English and Spanish about the FCEC Angler Outreach Program and fish contamination. The webinars and blogs were posted on HTB’s website and promoted through social media postings on HTB’s Twitter, Instagram, and Facebook accounts. The FCEC website linked to HTB’s blogs and webinars. HTB tracked website analytics for blogs and webinars posted on HTB’s website and social media pages to assess electronic outreach. The page views and average time per page were recorded monthly for the blogs and webinars. The reach was tracked on social media postings monthly by recording likes, reposts, views, and shares, as applicable.
- **Curriculum for pilot of virtual HTB Aquarium school field trips (March through May 2021)**—HTB prepared an education curriculum about the FCEC Angler Outreach Program and fish contamination for outreach to students that attend HTB Aquarium field trips. The curriculum included a virtual version of the aquarium field trip for use during a pilot period during the pandemic. HTB compiled a list of Los Angeles Unified School District schools in the top angler zip codes to conduct outreach. The virtual field trips request was posted to HTB’s website and promoted through their social media pages.

- **Pilot opening of HTB Aquarium patio (March through May 2021)**—HTB opened their aquarium patio in March 2021 with a ‘soft opening’ or pilot, to the public. The patio was open on Saturdays and Sundays between 12 and 4 pm. HTB created a poster sheet about the FCEC Angler Outreach Program, including a Quick Response (QR) code to HTB’s blog. The patio featured HTB’s poster sheet and a poster with the “Do Not Consume” fish (with QR code to the FCEC tip-cards in English, Spanish, Vietnamese, and Chinese), and physical tip-cards in English, Spanish, Vietnamese, and Chinese. The amount of aquarium visitors and QR scans were tracked monthly during the pilot period.

3.2 BAIT SHOP OUTREACH

HDR and DBS&A performed modified bait shop outreach that limited in-person contact during the reporting period. Instead of visiting the bait shops in person, HDR and DBS&A contacted 43 bait shops by telephone in August 2020 and July 2021, respectively. During the calls, HDR and DBS&A inquired about the bait shop’s current inventory of FCEC outreach materials (tip-cards in English, Spanish, Chinese, and Vietnamese), needs for replacement, and any other pertinent observations from the bait shop representatives. Based on the telephone discussions, HDR and DBS&A delivered the FCEC outreach materials to the bait shops using PPE and social distancing per COVID-19 guidelines.

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 viewed per session, the bounce rate (i.e., the percentage of visitors to a website who navigate away from the site after viewing one page), and the number of new or repeat visitors. The combined information from these datasets enabled a qualitative-quantitative analysis of the outreach effectiveness of the FCEC website. In addition, analytic data from Facebook Insights, such as the number of likes, fans reached, and user engagement provided additional data to assess outreach effectiveness.

As mentioned in Section 3.2, HTB tracked website analytics for the blogs and webinars posted on their website and promotions through social media postings to assess electronic outreach effectiveness between August 2020 and May 2021. HTB recorded page views and average time per page monthly for the blogs and webinars. The reach on social media postings was tracked monthly by recording likes, reposts, views, and shares as applicable.

During the last FCEC Partners meeting on 23 April 2019, FCEC partners were asked to participate in review of the updates and provide graphics, information, and/or recommendations to improve the FCEC website. EA worked with HDR and FCEC partners to update the FCEC website to address FCEC partners’ feedback, increase user traffic, achieve compliance with Section 508 accessibility requirements, and be viewable on mobile devices. The migration of the

FCEC website to the new format was completed during the previous reporting period in May 2020.

3.4 COMMUNITY EVENT OUTREACH

HDR, DBS&A, CCHC, and BPSOS have typically attended community outreach events at which they provide outreach materials. During each community event, the estimated number of attendees and/or tip-cards distributed (English, Spanish, Chinese, and/or Vietnamese) are recorded and these data are analyzed to determine outreach effectiveness to target communities. Due to the COVID-19 pandemic, there were no in-person community outreach events during this reporting period.

4. RESULTS

4.1 DAY ANGLER OUTREACH

4.1.1 Day Anglers Contacted During Outreach Period

During previous reporting periods, the numeric objective of the angler outreach was for HTB and Cabrillo to contact a minimum of 11,000 and 1,600 anglers, respectively. However, due to the COVID-19 pandemic, there was no numeric goal for the number of anglers to contact due to the uncertainty of when outreach would be resumed. HTB reached 1,012 anglers during June and July 2021. Cabrillo did not perform day outreach during the reporting period. Table 1 summarizes the total number of anglers HTB contacted by month and during the reporting period.

Because outreach was only conducted by HTB in June and July 2021, monthly and seasonal trends were not observed. Compared to June 2021, over twice the number of anglers were contacted in July; however, HTB resumed angler outreach in mid-June. The most popular pier for angler outreach was Santa Monica pier, making up approximately 25 percent of the total anglers reached. Rainbow Harbor pier was the least frequented by anglers, making up approximately 5 percent of the total anglers reached.

4.1.2 Day Angler Outreach Effectiveness (Contamination Awareness)

Information on angler awareness of the contamination and “Do Not Consume” warnings was collected during the angler outreach sessions in June and July 2021. Anglers were also 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 for all the piers monitored, angler awareness during the reporting period was 55 percent (553 of 1,012). The anglers reached at Rainbow Harbor had the most awareness with 88 percent of anglers aware of the contamination issues. Angler awareness was lowest at Hermosa (40 percent). With the exception of Pier J, angler awareness decreased at every pier in July 2021.

Of the anglers contacted at the piers who were aware of the contamination, on average, 96.4 percent spoke English, 3.1 percent spoke Spanish, and 0.5 percent spoke Chinese. Within each language group, English-speakers were the most aware of contamination (55 percent), followed by Spanish-speakers (50 percent), and Chinese-speakers (33 percent).

Tables 3 and 4 summarize the percent of respondents who were repeat or new respondents for the outreach period. During prior reporting periods, HTB recorded whether anglers were a new or repeat outreach respondent. HTB did not collect this information in June and July 2021. Instead HTB assumed that the data for anglers that responded with awareness by either a tip-card or the angler outreach team were a repeat angler. HTB resumed collection of the new and repeat data thereafter. Using HTB’s assumption, 29 percent of anglers were repeat respondents and 71 percent were new respondents among all fishing pier locations. However, this likely underestimates the number of repeat anglers, which is supported by data from the previous reporting period where 48 percent of anglers were repeat respondents and 52 percent of anglers

were new respondents. Belmont Pier had the highest approximate fraction of repeat respondents (41 percent) while Rainbow Harbor (18 percent) and Hermosa Beach (19 percent) had the lowest approximate repeat respondents. The remaining piers averaged between 27 percent and 31 percent for approximate repeat respondents.

HTB 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). Table 5 summarizes pier angler's source of awareness. Based on the results, the pier signage (40.8 percent) and tip-cards (33.2 percent) were reported as the most influential sources of information. Compared to the previous reporting period, pier sign awareness increased from 33.8 percent. The pier outreach team was the third highest reported outreach source (13.8 percent), a decrease from the previous reporting period (57.9 percent). Less influential sources of awareness that were reported were media (9.9 percent), friends/family (0.6 percent), and other sources (1.6 percent).

4.1.3 Day Angler Outreach Effectiveness (Geographic Distribution/Demographic Variability)

During the angler outreach, anglers were asked to provide the zip code where they live. Of the 1,012 anglers reached in June and July 2021, 79 percent (798 anglers) provided their zip code. Of the anglers who provided their zip code, 87.3 percent were from Los Angeles County, 10.9 percent were from Orange County, 1.0 percent were from San Bernardino County, and 0.5 percent were from Riverside County. As 99.7 percent of the angler outreach respondents who provided zip codes were from the four surrounding counties, the analysis focused on these geographic areas.

Figure 3 depicts the distribution and concentration of zip codes for Los Angeles, Orange, San Bernardino, and Riverside counties. The zip codes with the highest concentration of anglers were 90022 in east Los Angeles (18 respondents), 90011 in southeast Los Angeles (17 respondents), and 90255 in Huntington Park (17 respondents). Fifteen additional zip codes had greater than 10 respondents, all of which were in Los Angeles County. There was no single pier for which any of these zip codes were found at exclusively. 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. 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.

Table 6 summarizes the language distribution spoken by the anglers. The results indicate that 95.8 percent of the anglers spoke English and 4.2 percent were non-English speakers (3.4 percent Spanish speakers and 0.9 percent Chinese speakers). 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 HTB's angler outreach include English speaking, Spanish speaking, and a minority of Chinese speaking anglers.

4.2 NIGHT ANGLER OUTREACH

In June and July 2021, HTB performed angler outreach on Saturday evenings at Redondo Beach pier. Typically, HTB also performs evening outreach at Venice Beach pier, but the pier was closed for renovations during this reporting period. These piers were chosen based on previous observations of night anglers at these piers and safe evening access for the angler outreach team.

Table 7 summarizes the total number of anglers contacted. Based on the data, the evening outreach program reached a total of 176 anglers (69 anglers in June and 107 in July).

Table 8 summarizes the percent of anglers who responded that they were aware of the contamination and "Do Not Consume" warnings. On average, 60 percent of anglers reached during evening angler outreach exhibited awareness (n=105).

Tables 9 and 10 summarize the percent of respondents who were repeat or new respondents, respectively. As mentioned in Section 4.1.2, HTB did not record whether anglers were new or repeat outreach respondents during this reporting period, but they collected the information thereafter. Therefore, these data were approximated using the awareness source data. If an angler reported that their awareness source was either a tip-card or the outreach team, HTB assumed that they were a repeat angler. Using HTB's approximation, 28 percent of anglers were repeat respondents and 72 percent were new respondents among all fishing locations. However, this approximation likely underestimates the number of repeat anglers, which is supported by data from the previous reporting period where 41 percent of anglers were repeat respondents and 59 percent of anglers were new respondents.

Table 11 summarizes the awareness source for the night responders. FCEC tip-cards (44.0 percent) and pier signage (40.8 percent) were reported as the most influential sources of information. Less influential sources of awareness were media (13.6 percent), friends/family (0.8 percent), and other sources (0.8 percent). During the previous reporting period, the pier outreach team (77.8 percent) and pier signage (11.6 percent) were reported to be the highest sources of awareness. Due to COVID-19 during the majority of this reporting period, HTB was not present on the piers to disseminate information.

During the night angler outreach pilot program, anglers were asked to provide the zip code where they live. Of the 176 anglers reached, 93 percent (164 anglers) provided their zip code. Of the anglers who provided their zip code, 96.3 percent were from Los Angeles County and 3.7 percent were from Orange County. Figure 4 depicts the distribution and concentration of zip codes for Los Angeles and Orange counties. One zip code in Monterrey Park (91754) had greater than 10 respondents and 6 zip codes had between 5 and 10 respondents. The highest concentrations appear to occur within the area bounded by Interstate-110 to the west, Interstate-605 to the east, and Interstate-10 to the north. See Figure 4 for the graphical distribution of where anglers are from.

Table 12 summarizes the language distribution spoken by the anglers reached during the evening outreach. The results indicate that 95.5 percent of the respondents spoke English and that 4.5 percent were non-English speakers (all non-English speakers spoke Chinese). All non-English speakers who provided zip codes resided in Los Angeles County.

4.3 BAIT SHOP OUTREACH

HDR conducted outreach at 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) in two parts in August and October 2020.

During the week of August 7-14, 2020, 40 bait shops were contacted via telephone in lieu of in-person visitation to assess the shops' FCEC outreach material inventory and COVID-19 effect on business. Of the 40 bait shops, four requested more materials near Venice and Ballona Creek piers (Big 5 Sporting Goods, Del Rey Landing, Bay Market) and Redondo Beach pier (Dawn to Dusk Liquor). These shops indicated an increase in business since the COVID-19 pandemic. On October 15, 2020, HDR staff provided additional materials (tip-cards in English, Spanish, Vietnamese, and Chinese) to the four shops that requested additional materials in August. HDR noted that the shops that are familiar with and understand the importance of the FCEC program are small, locally owned shops. Chain stores, especially the West Marine stores, have large employee pools and turnover. Additionally, the West Marine stores require the FCEC outreach materials to be stored near their information board, located in the back of the store, away from the bait freezer.

DBS&A took over HDR's outreach responsibilities in November 2020 and conducted bait outreach in July 2021. DBS&A contacted 43 bait shops by telephone; 33 of the shops indicated they needed more materials, 7 had enough materials (Kelly Marin, Mahi Tackle Sport Fishing Supplies, Jimmy Caivo Bait & Tackle, Fishermans Hardware, and 7-Eleven [1], 7-Eleven [3], and 7-Eleven [4]), and 3 were closed to business (Adventure 16, Manhattan Mart, and Tackle Junkies) during the reporting period (Figure 2). Between July 22 and July 26, 2021, DBS&A delivered the FCEC outreach materials to the 33 bait shops that requested materials. DBS&A identified one new bait shop to replace a closed business. Abe's Liquor in Hermosa Beach was contacted by telephone and was receptive to participating in the next round of bait shop outreach. Tip-cards were distributed in English (1,400), Spanish (1,275), Chinese (250), and Vietnamese (300). The following 33 bait shops received FCEC outreach materials in July 2021:

1. ARCO AM/PM.
2. Baja Fish Gear.
3. Bay Market.
4. Big Fish Bait & Tackle.
5. Charkbait.
6. Del Rey Landing.
7. El Don Liquor Store.
8. Family Deli and Grocery.
9. Gaffey Liquor.
10. Hello Liquor.

11. Let's Go Fishing.
12. Liquor Depot.
13. M&P Liquor.
14. Manhattan Grocery.
15. Mr. C's Liquor.
16. Pacific Edge Bait and Tackle.
17. Redondo Food Mart.
18. Seal Beach Liquor Store.
19. Supreme Liquor.
20. West Beach Liquor Store.
21. 7 Eleven (2).
22. ABC Fine Wine.
23. Best Bait and Tackle.
24. Big 5 Sporting Goods.
25. Catalina Liquor & Deli.
26. Dawn to Dusk Liquor.
27. Pacific Wilderness.
28. Rosa's Liquor Market.
29. Stanley's Liquor Jr. Market.
30. West Marine (1).
31. West Marine (2).
32. West Marine (3).
33. West Marine (4).

DBS&A noted that displaying the tip-cards with the back of the card facing outward might draw more attention to the tip-cards. The back of the card shows a list of which fish should not be eaten.

During the previous reporting periods, four shops in multiple cities requested tip-cards in Korean. These requests represent a growing trend of Korean speaking anglers in multiple location groups. However, no Korean language materials were requested during this reporting period.

4.4 ELECTRONIC OUTREACH

Figures 5 and 6 and Table 13 summarize the Google Analytics datasets that were collectively used to quantify electronic outreach effectiveness. Based on the data, the FCEC website experienced a sustained increase in visitors, measured by the number of sessions or visits to the webpage, unique users, and page views between August 2020 and July 2021. During this time, the bounce rate decreased from 87.7 percent in the previous reporting period to 64.2 percent. Similarly, the percent of new users decreased slightly from 99.2 percent to 97.8 percent. The number of sessions, users, and page views increased from a total of 1,657, 1,531, and 2,116, respectively, during the previous reporting period, to a total of 13,950, 9,650, and 23,690 during this reporting period. The number of sessions, users, and page views was highest in February 2021 (1,780 users, 5,370 page views) and lowest in August 2020 (115 users, 256 page views).

The bounce rate remained fairly constant during this time with an average of 64.4 percent, with the lowest bounce rate (42.3 percent) in March 2021 and the highest (73.2 percent) in February 2021. New users averaged more than 98 percent for the majority of this time period, although in July 2021 new users were only 93.2 percent. The pages per session data remained fairly constant with an average of 1.8 pages per session. The session duration remained fairly consistent at 51 seconds per session. In addition to overall website usage, Google Analytics tracks demographic data, specifically country, region/state, city, and metro area. Visitors from the United States made up 73.7 percent of visitors to the website who had tracking turned on. Among those, 81.5 percent were from California. In California, the top five cities with visitors to the website included Los Angeles, San Diego, Long Beach, San Francisco, and San Jose. Approximately 18 percent of visitors to the website were from Los Angeles (1,724 users), followed by 2.3 percent from San Diego (226 users), 1.7 percent from Long Beach (161 users), 1.7 percent from San Francisco (161 users), and 1.6 percent from San Jose (158 users).

The Facebook Insights data are presented in Figures 8 and 9. Figure 8 shows the number of likes the Facebook fan page had between August 2020 to July 2021. Figure 9 presents the number of fans reached (unique views) and the number total impressions (all views) during the outreach period for each post to the Facebook fan page. As of July 2021, the Facebook fan page had 4,424 likes from fans, down from 4,462 at the end of the previous reporting period. The Facebook fan page likes had a steady decrease in overall likes throughout the year. The number of likes shows a declining trend of approximately three likes per month which is consistent with last year's Facebook Insights data. The first graph in Figure 8 shows that reach was low, overall, with a maximum of 4 unique users reached and an average of less than one unique user reached per day. Unlike prior years, engagement was not measured during this reporting period because no posts were made directly to the Facebook fan page by FCEC partners. HTB staff shared blog posts via the community tab of the Facebook fan page, but because these posts were not made directly to the FCEC Facebook page, they are not included in Facebook Insights Data.

HTB began posting monthly blogs and educational webinars on their website for linkage from the FCEC website in May 2020 and continued these posts during this reporting period between August 2020 and May 2021. HTB tracked website analytics for the blogs and webinars posted on their main website and social media posts to assess electronic outreach. The blogs reached an average of 19 users per blog with an average of 2.1 minutes per page. The webinars reached an average of 1.6 people live and 1.8 people recorded. Table 14 presents HTB's website analytics data for the blogs and webinars. These blogs were advertised through HTB's social media posts. Facebook posts advertising these blogs in both English and Spanish averaged 5 reactions per post and reached an average of 523 people. Tweets averaged 1,198 impressions and 4 likes, each, and Instagram posts averaged 486 likes.

Additional alternative electronic outreach activities performed by HTB included development of an educational presentation about the FCEC angler outreach program and fish contamination that could be presented virtually through their Speakers Bureau. HTB added the FCEC Angler Outreach Program presentation to their Speakers Bureau website request form so that groups may request a speaker. The presentations were also promoted through HTB's website and social media. However, no sign-ups were recorded during the reporting period. HTB also prepared a

virtual education curriculum about the FCEC angler outreach program and fish contamination for outreach to students that attend HTB Aquarium field trips. The virtual field trips request was posted to HTB's website and promoted through their social media pages. HTB compiled a list of ten Los Angeles Unified School District schools and 27 teachers in the top angler zip codes to conduct outreach. They contacted the teachers by email and direct phone calls and there were no signups during the reporting period.

BPSOS also performed alternative electronic outreach to replace community event attendance during the reporting period. BPSOS translated FCEC outreach materials that have not previously been translated into Vietnamese. BPSOS also posted FCEC program information and the translated FCEC outreach materials to their website. EA posted the translated materials to the FCEC website. The FCEC materials translated into Vietnamese include the following:

- Common Subsistence and Sport Fish of Southern California Fish Identification.
- Fish contamination map showing red and yellow zones of DDT and PCB contamination.
- Identifying Croakers.
- Fish Market Owner Fact Sheet.
- Remedial Investigation Report Fact Sheet.
- Safer Fish Preparation and Cooking Guide.

4.5 COMMUNITY EVENT OUTREACH

There were no in-person community events conducted due to the COVID-19 pandemic. Therefore, HDR, DBS&A, BPSOS, and CHCC attended no events during this reporting period.

HTB opened their aquarium patio to the public in March 2021 with a "soft opening" or pilot. The patio featured posters with FCEC angler outreach program information and a poster showing the "Do Not Consume" fish with QR codes that linked to HTB's blog and the FCEC tip-cards in English, Spanish, Vietnamese, and Chinese. Physical tip-cards in English, Spanish, Vietnamese, and Chinese were also displayed. Table 15 shows the HTB's record of the total number of visitors to the aquarium patio and QR code scans completed between March and May 2021. A total of 4,212 people visited the aquarium patio, with a steady increase in visitors between March and April. A total of seven QR scans were completed during the pilot period.

5. DISCUSSION AND RECOMMENDATIONS

Due to the COVID-19 pandemic, the Community Involvement Program was limited in its ability to perform outreach activities during this reporting period due to local, state, and/or federal restrictions on public gatherings. Therefore, there were no in-person community events and angler outreach was suspended until June 2021. During this reporting period, the community and angler outreach was predominantly electronic, which was not as effective as in-person outreach has been in prior years. Therefore, there is discontinuity in the data for this reporting period. The following sections discuss conclusions and recommendations for each component of the outreach program.

5.1 ANGLER OUTREACH

Due to the COVID-19 pandemic, HTB was only able to perform angler outreach in June and July 2021. Cabrillo did not perform angler outreach during this reporting period and, therefore, there is no outreach data for Cabrillo pier. In addition, Venice pier was closed during this reporting period. As a result, there are no data for this pier from the day and evening outreach efforts.

When compared to the last outreach period before the COVID-19 pandemic (June and July 2019), outreach in June and July 2021 was significantly lower at all piers except Santa Monica, which increased in both June and July. Among all piers, total anglers reached in June 2021 was only 33 percent of the total anglers reached in June 2019 (not including Venice or Cabrillo Piers). However, total anglers reached in July 2021 was up to 72 percent of the total anglers reached in July 2019. This increase between June and July 2021 was observed at all piers. The low number of anglers reached in June 2021 is likely due to outreach activities not resuming until mid-June. The overall decrease in anglers reached compared to June and July 2019 is likely a result of the COVID-19 pandemic.

Daytime awareness data collected for this reporting period indicated that 55 percent of anglers were aware of contamination. This is the same as the last reporting period. This is down from the approximately 76 percent that reported being aware during the previous three periods between July 2016 and July 2019. This may be attributed to a higher percent of new anglers, which were observed on the piers during closures of public spaces during the COVID-19 pandemic in this reporting period. However, because the dataset is not complete, the number of new anglers may be over-represented for this outreach period. Compared to the day angler outreach, the evening angler outreach data show an average of 60 percent aware of the contamination. This is an increase from the last reporting period that showed 49 percent of night angler respondents were aware of the fish contamination.

Overall, the variability in the languages reported is consistent with the previous four reporting periods (2016-2019), which was less variability in language compared to 2015-2016 reporting. While English is the primary language spoken during both the day and evening angler outreach, more Spanish speakers were observed during the day while more Chinese speakers were observed during the night. This is opposite of the results recorded during the pilot night angler program in 2017, which indicated more Spanish than Chinese language speaking anglers. Continued monitoring of the night angler languages over future reporting periods is

recommended to a get better understanding of this trend. It was also noted that awareness in the Chinese speaking community was the lowest among the three groups during daytime outreach (33 percent), but was highest during night outreach (88 percent), although the sample size is small.

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. The demographic variability data, as measured through the angler languages spoken, presents a more limited variety of ethnicities and cultures being reached through the outreach program; however, responses to languages are limited to single answers, and may not accurately reflect the demographics reached through the program.

The sources of awareness that anglers cited for how they learned of the contamination were primarily the “Do Not Consume” fish pier signage and FCEC tip-cards. During previous reporting periods, the angler outreach team was one of the highest sources of awareness. This difference is likely due to decreased in-person angler outreach during the COVID-19 pandemic. However, the “Do Not Consume” fish pier signage and tip-cards continue to be successful components of the pier angler program outreach.

5.2 BAIT SHOP OUTREACH

Overall, the modified bait shop outreach events were successful. The majority of shops remembered the FCEC program and most of the outreach materials were distributed. As of July 2021, 43 bait shops were contacted and 33 shops required additional outreach material compared to only 4 shops that requested outreach material in August 2020. This may be due to observations of increased fishing at the piers during the COVID-19 pandemic. It is recommended to monitor bait shops that were not in need of outreach materials to evaluate whether they need replacement by more popular locations in the area. No bait shops were replaced during this reporting period; however, three bait shops were reported to be out of business in July 2021. One replacement shop was identified and outreach material will be delivered during the next reporting period. This will bring the total to 40 bait shops, which is the amount routinely targeted for outreach. Overall, the identification and tracking of bait shop turn-over continues to be effective.

Korean outreach materials were requested in four areas (San Pedro, Long Beach, Seal Beach, and Huntington Beach) during previous reporting periods. This represents a growing trend of Korean speaking anglers in multiple locations. It is recommended in the next reporting period to follow-up with the bait shops and evaluate printing and distributing bait shop outreach materials in Korean to reach this community.

Based on previous bait shop outreach efforts, it is recommended to assess whether the West Marine stores should be replaced with smaller community-based bait shops. West Marine is a large specialty store devoted to boating, and not all locations sell bait. Large shops like West Marine also have more employee turnover and therefore needed more time spent explaining the program and the importance of educating the public of the health risks. Of West Marine’s clientele that fish, a large majority do so offshore, outside of the red and yellow zones.

Additionally, the West Marine stores require the Palos Verdes materials to be stored near their information board, located in the back of the store, away from the bait freezer.

5.3 ELECTRONIC OUTREACH

The Google Analytics for the FCEC website and Facebook Insights data present the effectiveness of the two media in reaching the public. The Google Analytics data indicate that since August 2020, visits to the FCEC website have increased significantly, and engagement with the website increased significantly as well, as reflected by the bounce rate and page views per session. On average, session duration did not increase compared to the previous reporting period. The top two pages visited after August 2020 included the main page of the website (22.5 percent) and the safe to eat fish page (12.8 percent). Other contamination-specific pages were included in the top ten sites visited. Based on these results, the FCEC website increased its effectiveness reaching the public. One reason may be the FCEC website updates completed in May 2020. Other reasons may be due to the increased traffic on the piers during COVID-19 and increased promotion of electronic outreach through partners' social media. It is recommended to continue the increased partner engagement and maintenance on the FCEC website and social media pages to improve electronic outreach.

The Facebook Insights data evaluation suggests similar limited outreach effectiveness as previous reporting periods. Since August 2020, the Facebook fan page has seen a steady drop in the number of users who like the page, which is likely due to the lack of partner activity on the Facebook fan page, such as posts, comments, and or responses to posts and comments. Overall, the Facebook fan page is least effective at reaching the public. Other social media pages, such as Instagram and Twitter, appear to be more popular and effective at reaching the public.

Alternative electronic outreach activities performed by HTB and BPSOS had varying success. BPSOS successfully translated a number of FCEC outreach materials into Vietnamese and posted them to their website, which was linked from the FCEC website. Similarly, HTB's blogs and webinars were posted on their website, were linked from the FCEC website, and were promoted through social media pages. These efforts were somewhat successful in engaging people during the pandemic. However, the other alternative electronic outreach, virtual educational presentations, and aquarium school field trips, were less successful. This may be due to shifts in school schedules caused by COVID-19 (hybrid in-person/virtual curriculum), reduced focus on extra-curricular activities, and the school year was ending. It is recommended for the partners to continue posting FCEC program information on social media pages.

As COVID-19 restrictions lift in the next reporting period, it is recommended that conventional in-person outreach activities resume in lieu of these alternative activities.

5.4 COMMUNITY EVENT OUTREACH

Due to COVID-19 restrictions that continued into this reporting period, no events were attended. HTB performed a limited "soft opening" or pilot of their aquarium patio to the public on Saturdays between March and May 2021. While the aquarium visitors increased over the time period, the QR scans were relatively low compared to the number of visitors at the aquarium.

Therefore, this mode of outreach does not appear to be effective and is not recommended to be continued.

Once in-person community outreach is resumed, it is recommended that community outreach partners continue to collaborate with other community organizations and increase partner participation in order to diversify the community events and reach more anglers in the Los Angeles area, including Spanish, Chinese, and Vietnamese communities. It is also recommended to encourage community event attendees to use the sign-in sheets to indicate whether they are aware of the DDT/PCB fish contamination advisories and what is the awareness source (signs, tip-card, community event, outreach team, internet, media, friend/family, other).

5.5 FCEC PARTNERS MEETINGS

A FCEC Partners Meeting was planned for April 2020, during the previous reporting period, for stakeholders to discuss the angler, community, and enforcement outreach activities. However, due to the COVID-19 pandemic, the meeting was postponed indefinitely and was not held during this reporting period. Once in-person public meetings resume, it is recommended to hold the meeting and discuss new and outstanding issues from the previous reporting periods and resume partners' outreach activities under the FCEC program.

5.6 RESUMING OUTREACH ACTIVITIES

As mentioned previously, State restrictions on public gatherings due to the COVID-19 pandemic were implemented in mid-March 2020. During this time, only essential businesses (e.g., medical facilities, grocery stores, restaurant food take-out/delivery) were open to the public. Outdoor activities (e.g., visits to the piers) were permitted toward the end of this reporting period. However, due to continued social distancing requirements, many in-person outreach activities, including community events, did not resume.

There remains a need to continue outreach education to pier anglers and the local community. It is recommended that the partners continue routine angler and community outreach activities when the public restrictions are lifted. Some activities may still be performed without in-person contact such as electronic outreach and virtual meetings. When the restrictions are lifted, the FCEC partners meeting and fish identification training will be scheduled to regroup and train partners so that they are ready to resume outreach.

FIGURES

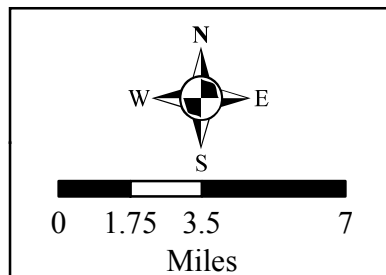
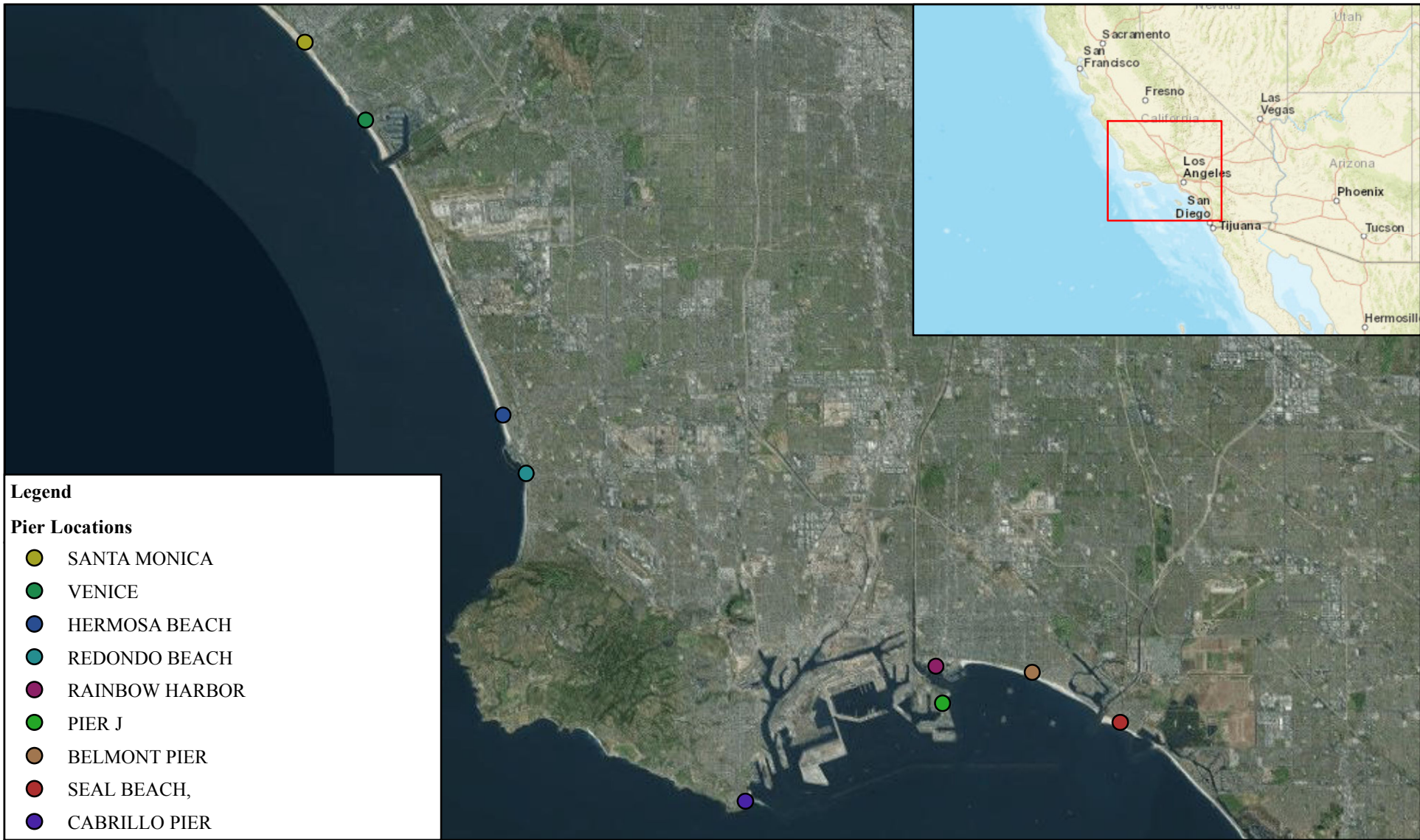
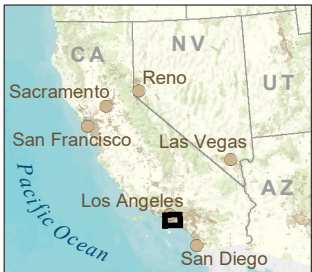


Figure 1. Pier Locations Map

Palos Verdes Shelf Superfund Site
Los Angeles County, California



Legend

- Bait Shop Location
- Bait Shop Closed 2021
- ◆ Pier/Coastal Structure

September 2021
 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

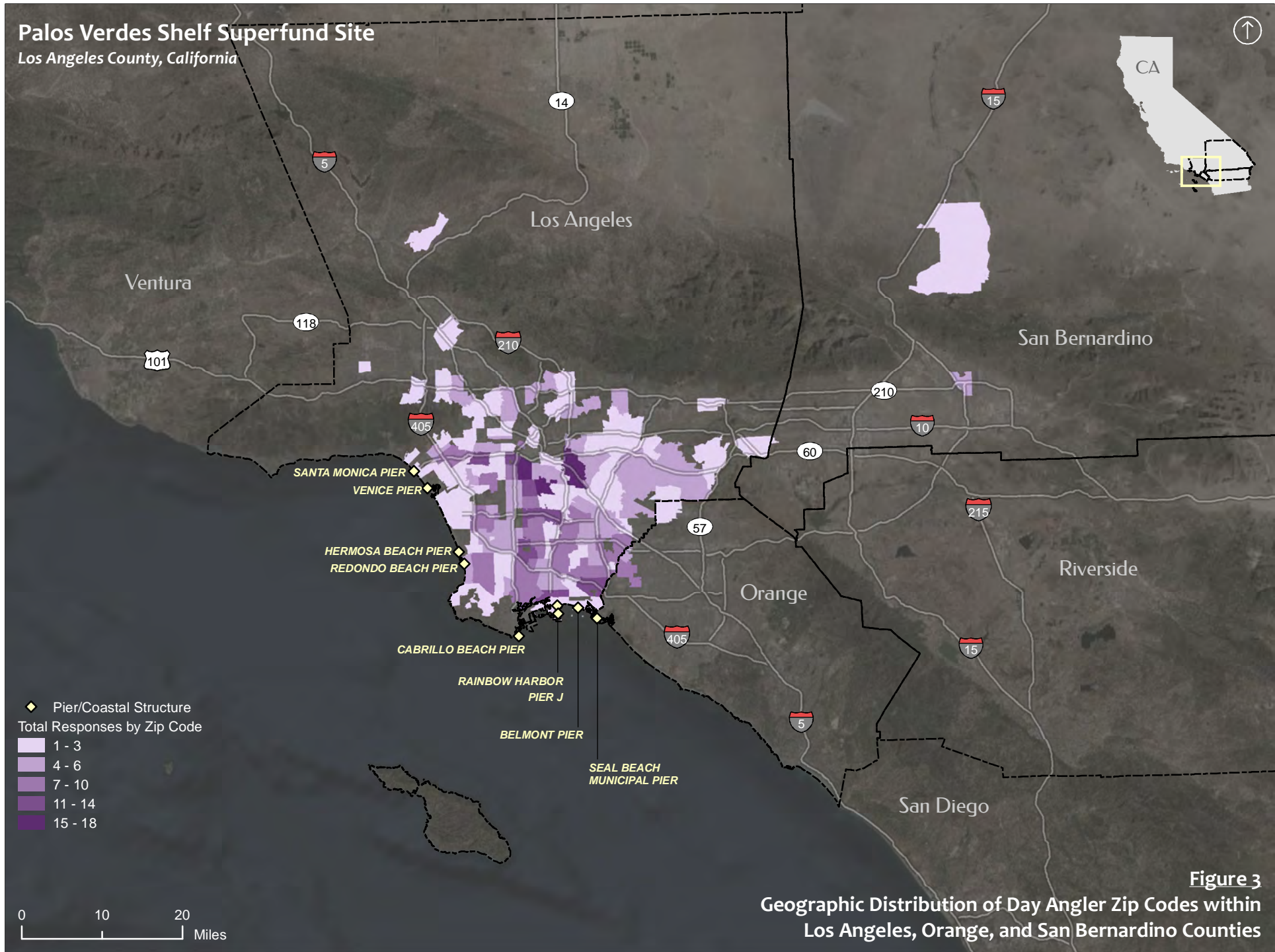


Figure 3
Geographic Distribution of Day Angler Zip Codes within Los Angeles, Orange, and San Bernardino Counties

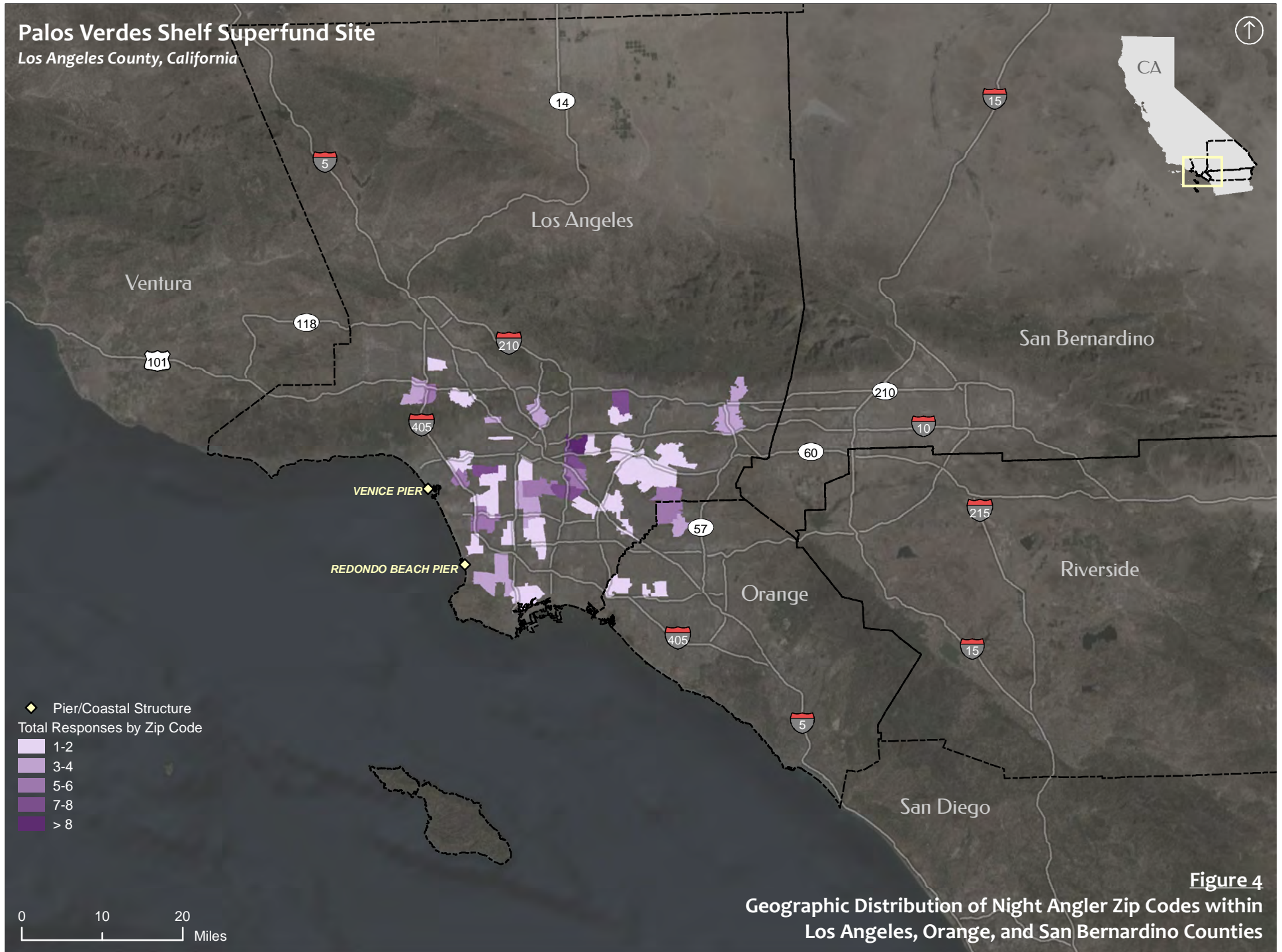


Figure 5. Total Sessions, Users, Page Views, Bounce Rate, and New Users

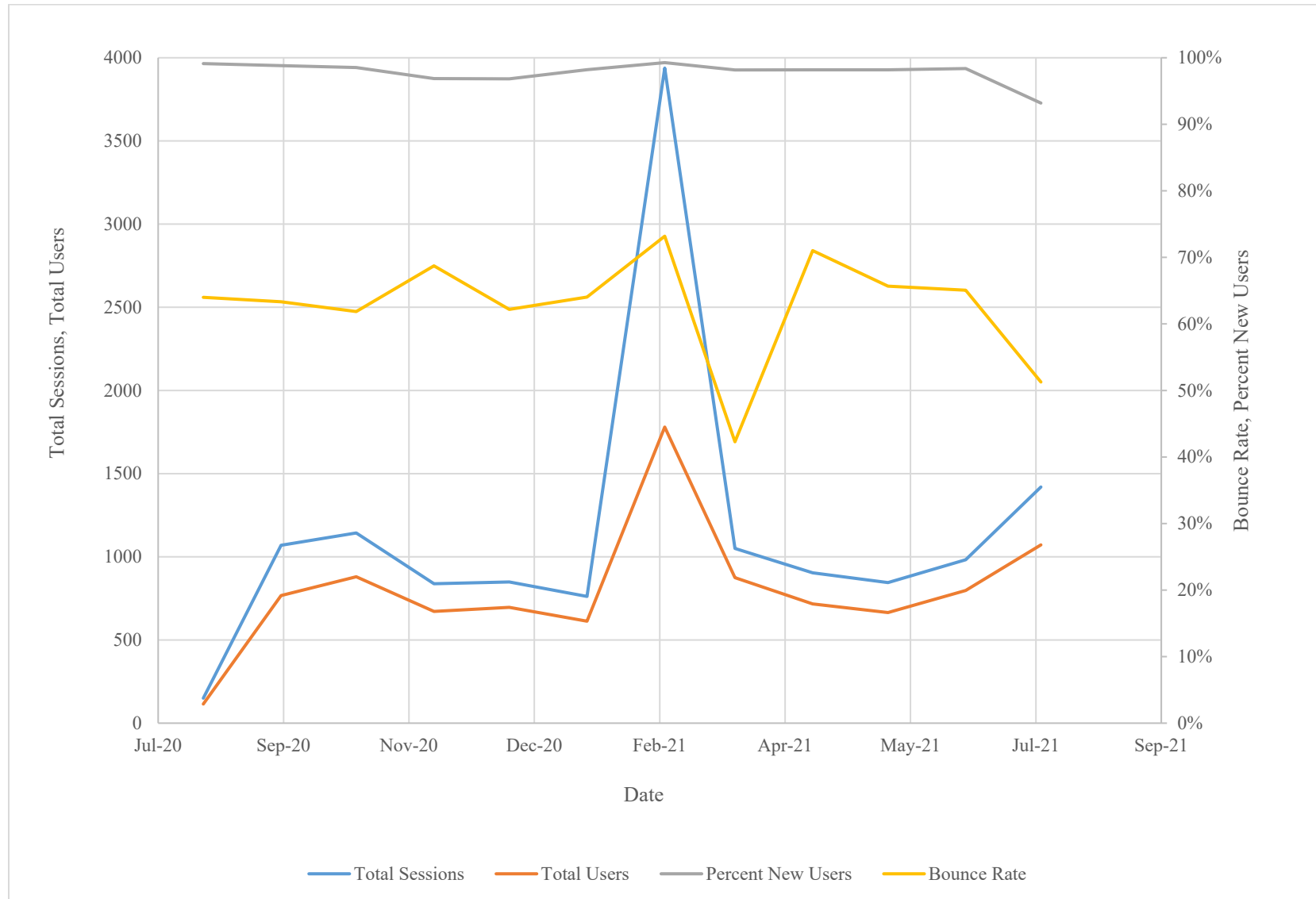


Figure 6. Pages per Session and Average Session Duration

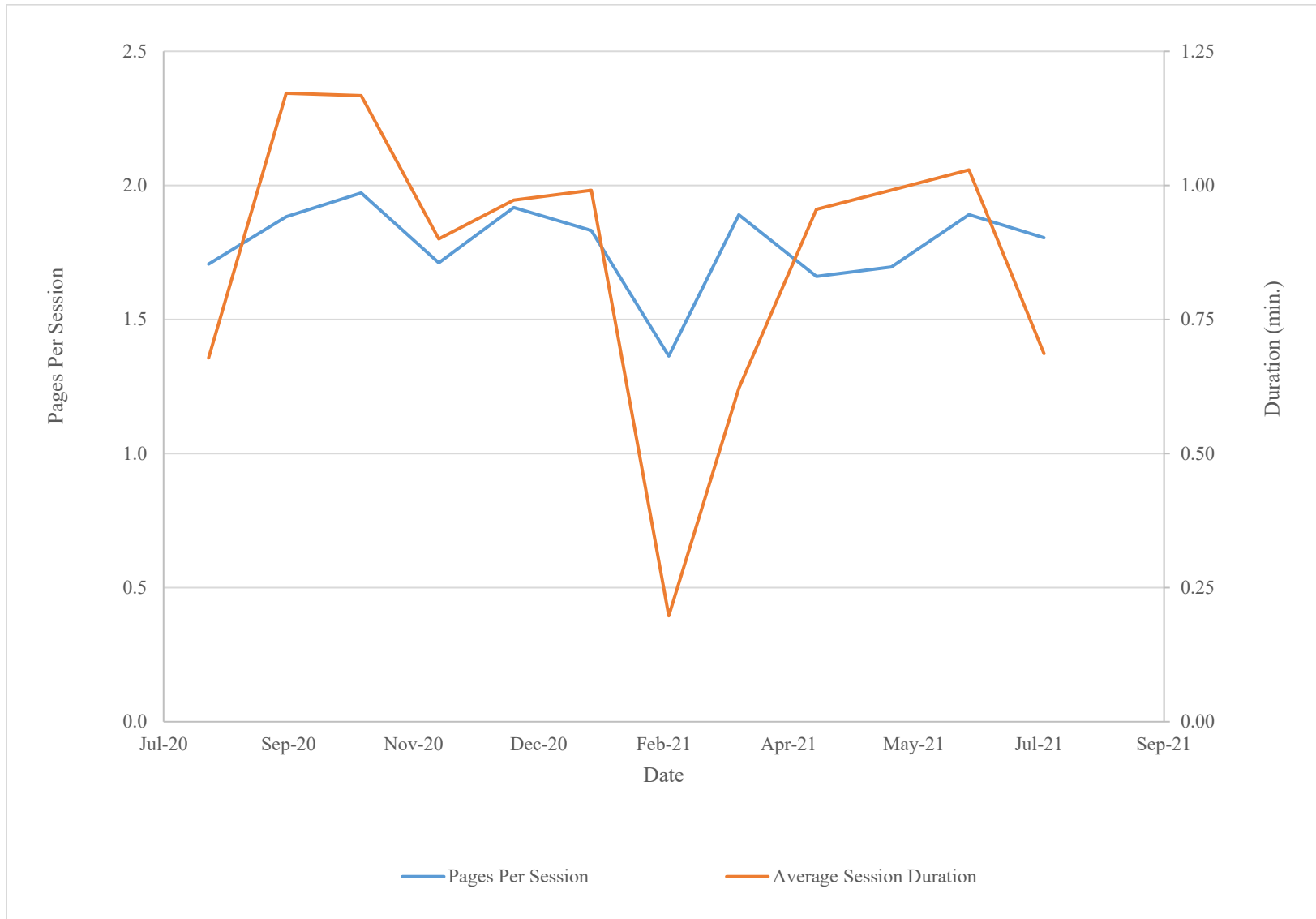


Figure 7. Number of “Likes” Received by the FCEC Facebook Fan Page

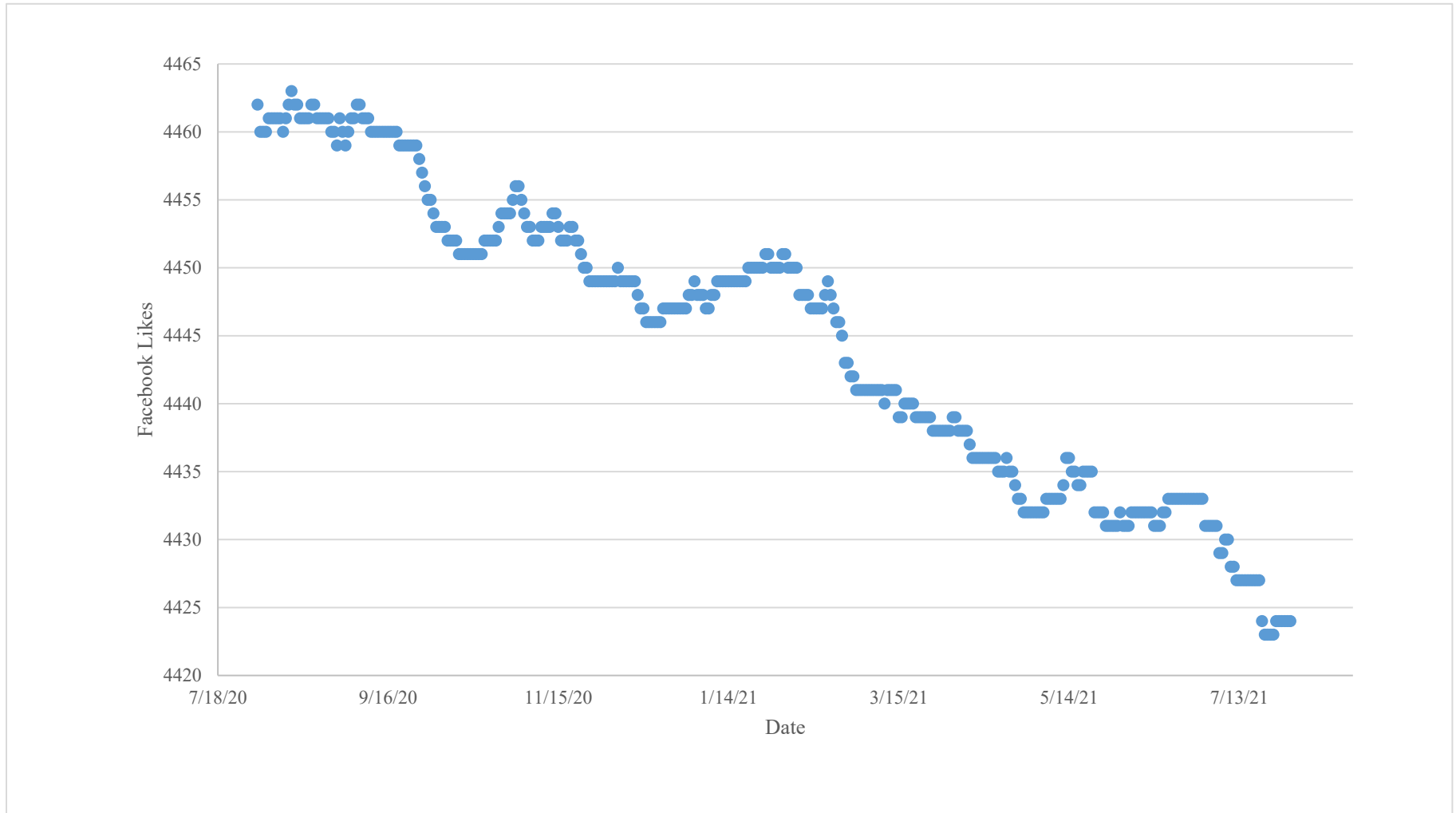
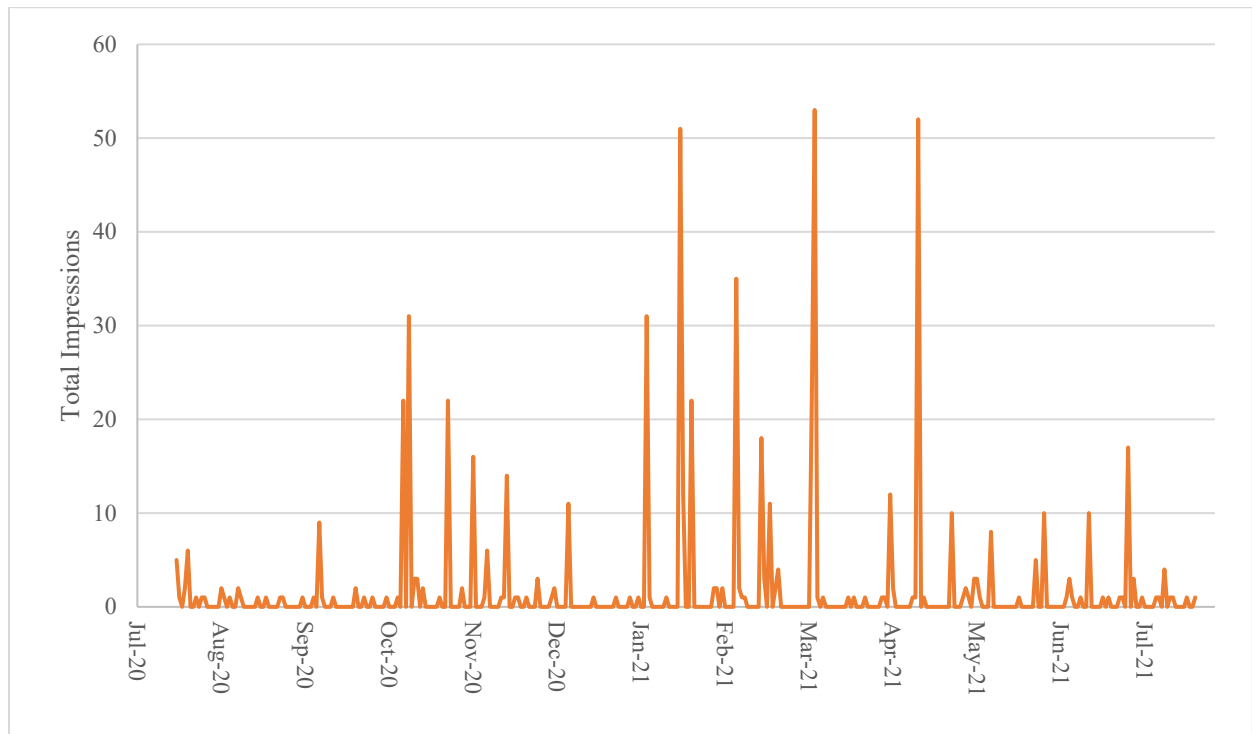
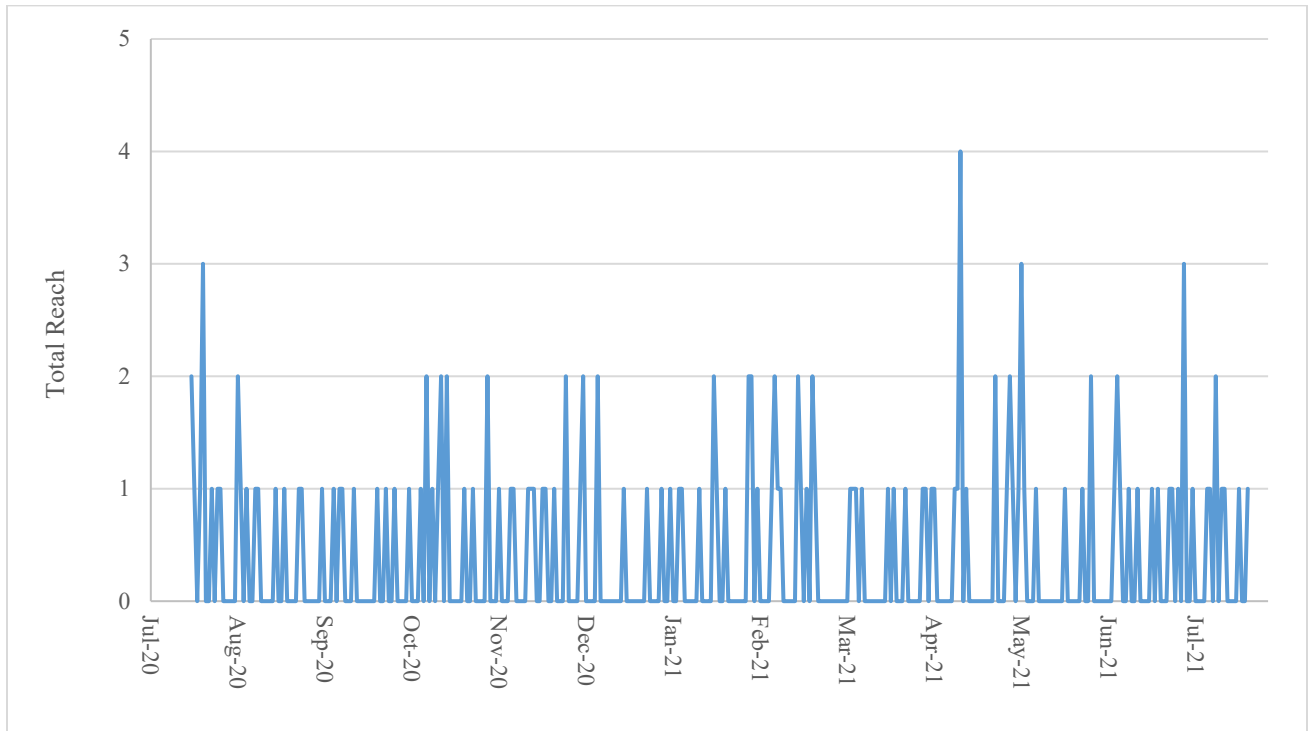


Figure 8. Total Reach (Unique Views) and Total Impressions (All Views) to the FCEC Facebook Page



TABLES

Table 1. Day Anglers Contacted During Outreach Period

Date	Belmont	Cabrillo	Hermosa Beach	Pier J	Rainbow Harbor	Redondo Beach	Santa Monica	Seal Beach	Venice	Grand Total
Jun-2021	47	--	13	34	14	35	96	46	--	285
Jul-2021	109	--	95	77	35	146	159	106	--	727
Total (Outreach Period)	156	--	108	111	49	181	255	152	--	1,012

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

Date	Belmont	Cabrillo	Hermosa	Pier J	Rainbow Harbor	Redondo	Santa Monica	Seal Beach	Venice	Average
Jun-2021	70%	--	46%	56%	93%	60%	73%	54%	--	66%
Jul-2021	39%	--	39%	64%	86%	52%	58%	37%	--	50%
Average	49%	--	40%	61%	88%	54%	64%	42%	--	55%

Table 3. Repeat Respondents to Day Angler Outreach

Date	Belmont	Cabrillo	Hermosa	Pier J	Rainbow Harbor	Redondo	Santa Monica	Seal Beach	Venice	Average
Jun-21	21%	--	31%	26%	29%	20%	27%	13%	--	23%
Jul-21	50%	--	17%	32%	14%	31%	28%	34%	--	31%
Average	41%	--	19%	31%	18%	29%	27%	28%	--	29%

Table 4. New Respondents to Day Angler Outreach

Date	Belmont	Cabrillo	Hermosa	Pier J	Rainbow Harbor	Redondo	Santa Monica	Seal Beach	Venice	Average
Jun-21	79%	--	69%	74%	71%	80%	73%	87%	--	77%
Jul-21	50%	--	83%	68%	86%	69%	72%	66%	--	69%
Average	59%	--	81%	69%	82%	71%	73%	72%	--	71%

Table 5. Source of Day Angler Awareness

	Awareness Source								Total
	Pier Signage	Tip-Card	Pier Outreach Team	Internet	Events	Media	Friends/Family	Other	
Belmont	31	41	22	0	0	11	2	0	107
Cabrillo	--	--	--	--	--	--	--	--	--
Hermosa	23	15	5	0	0	7	0	3	53
Pier J	26	22	12	0	0	4	0	4	68
Rainbow Harbor	34	9	0	0	0	2	0	0	45
Redondo	47	46	6	0	0	6	0	0	105
Santa Monica	68	45	25	0	0	19	2	3	162
Seal Beach	23	27	15	0	0	12	0	0	77
Venice	--	--	--	--	--	--	--	--	--
Total	252	205	85	0	0	61	4	10	617
Percent (total Sources)	40.8%	33.2%	13.8%	0.0%	0.0%	9.9%	0.6%	1.6%	--

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

Language Spoken	Los Angeles	Orange	San Bernardino	Riverside	Total
English	97.3%	100.0%	100.0%	0.0%	95.8%
Spanish	1.4%	0.0%	0.0%	100.0%	3.4%
Chinese	1.3%	0.0%	0.0%	0.0%	0.9%

Table 7. Night Anglers Contacted During Outreach Period

Date	Redondo	Venice	Total
Jun-21	69	--	69
Jul-21	107	--	107
Total (Night Outreach)	176	--	176

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

Date	Redondo	Venice	Average
Jun-21	59%	--	59%
Jul-21	60%	--	60%
Average	60%	--	60%

Table 9. Repeat Respondents to Night Angler Outreach

Date	Redondo	Venice	Average
Jun-21	28%	--	28%
Jul-21	28%	--	28%
Average	28%	--	28%

Table 10. New Respondents to Night Angler Pilot Outreach

Date	Redondo	Venice	Average
Jun-21	72%	--	72%
Jul-21	72%	--	72%
Average	72%	--	72%

Table 11. Source of Night Angler Awareness

	Awareness Source								
	Pier Signage	Tip-Card	Pier Outreach Team	Internet	Events	Media	Friends/Family	Other	Total
Venice	--	--	--	--	--	--	--	--	--
Redondo	51	55	0	0	0	17	1	1	125
Total	51	55	0	0	0	17	1	1	125
Percent (total Sources)	40.8%	44.0%	0.0%	0.0%	0.0%	13.6%	0.8%	0.8%	--

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

Language Spoken	Los Angeles	Orange	Riverside	San Bernardino	Total
English	94.9%	100%	0%	0%	95.5%
Spanish	0.0%	0%	0%	0%	0.0%
Chinese	7.8%	0%	0%	0%	4.5%

Table 13. Summary of Google Analytics Data

Date	Total Sessions	% Change from Previous Month	Users	Page Views	Pages/ Session	Avg. Session Duration (minutes)	Bounce Rate	New Users	Returning Users
Aug-2020	150		115	256	1.71	0:41	64.00%	114	0.9%
Sep-2020	1069	613%	767	2013	1.88	1:10	63.33%	758	1.2%
Oct-2020	1143	7%	880	2254	1.97	1:10	61.85%	867	1.5%
Nov-2020	838	-27%	672	1434	1.71	0:54	68.74%	651	3.1%
Dec-2020	849	1%	696	1628	1.92	0:58	62.19%	674	3.2%
Jan-2021	762	-10%	613	1396	1.83	0:59	64.04%	602	1.8%
Feb-2021	3938	417%	1780	5370	1.36	0:12	73.18%	1767	0.7%
Mar-2021	1050	-73%	875	1985	1.89	0:37	42.29%	859	1.8%
Apr-2021	904	-14%	717	1501	1.66	0:57	71.02%	704	1.8%
May-2021	845	-7%	665	1433	1.70	0:59	65.68%	653	1.8%
Jun-2021	982	16%	798	1857	1.89	1:02	65.07%	785	1.6%
Jul-2021	1420	45%	1072	2563	1.80	0:41	51.27%	999	6.8%

Table 14. Summary of Heal the Bay Website Analytics Data

Title	Date	Page Views	Average Time on Page
Increase in Angling and Harvesting in Palos Verdes Sparks Public Health Concern	8/31/20	55	2:56
Aumento de la pesca y la recolección en Palos Verdes genera preocupación para la salud pública	8/31/20	19	1:31
Spotlight on Venice Pier, a Favorite Fishing Location in Santa Monica Bay	9/30/20	39	1:17
El muelle de Venice, un lugar de pesca favorito en la bahía de Santa Monica	9/30/20	19	2:27
Learning About LA's Vibrant Community of Anglers	10/29/20	59	0:53
Aprendiendo sobre la vibrante comunidad de pescadores de Los Angeles	10/29/20	20	0:56
Redondo Beach Pier, a Favorite Fishing Pier in Santa Monica Bay	12/22/20	3	0:11
Muelle de Redondo Beach, un muelle de pesca favorito en la bahía de Santa Mónica	12/22/20	2	0:06
Hermosa Beach Pier, A Quiet Fishing Spot in Santa Monica Bay	1/29/21	17	1:49
Muelle de Hermosa Beach, un lugar de pesca tranquilo en la bahía de Santa Mónica	1/29/21	7	6:57
Long Beach's Belmont Pier, the Busiest Fishing Pier	2/29/21	19	2:49
Belmont Pier de Long Beach, el muelle de pesca más concurrido	2/29/21	13	1:34
All You Need to Know about Fishing at Seal Beach Pier in Orange County	3/30/21	23	3:31
Todo lo que necesitas saber sobre la pesca en Seal Beach Pier en el condado de Orange	3/30/21	11	0:19
Rainbow Harbor Piers in Long Beach, a place where you have to be careful what you fish	4/27/21	18	4:37
Rainbow Harbor Piers en Long Beach, un lugar donde debes tener cuidado con lo que pescas	4/27/21	8	0:51
Fishing at Long Beach's Pier J	5/31/21	12	0:48
Nuevas oportunidades de pesca en Pier J de la ciudad Long Beach	5/31/21	6	5:51
Mes de la Limpieza Costera: Muelles de Pesca Visitados por el Equipo de Angler Outreach Program de Heal the Bay	9/23/20	0	NA
Coastal Cleanup Month: How to Protect our Coastal Resources and People	9/24/20	4	100%
Heal the Bay Gotitas del Saber: Pescado escalofriante de la bahía de Santa Mónica	10/28/20	1	100%
Heal the Bay Gotitas del Saber: De Donde son los Pescadores	11/10/20	2	100%
Gotitas Del Saber- Contaminación por DDT en la costa de Los Angeles	12/15/20	1	100%

Table 15. Summary of Heal the Bay Aquarium Patio Pilot Opening Data

	March	April	May
Visitors to Heal the Bay Aquarium	361	1,364	2,487
QR Code used for Heal the Bay Blog	1	0	0
QR Code used for English Tip-Card	1	0	2
QR Code used for Spanish Tip-Card	1	0	0
QR Code used for Chinese Tip-Card	1	0	0
QR Code used for Vietnamese Tip-Card	1	0	0