

2022-23 Risk Assessment: Available Data

Last updated: January 9, 2022

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TRIGGERS REQUIRING MANAGEMENT ACTION

Confirmed Entanglements: §132.8(c)(1)

Data provided by: Lauren Saez and Dan Lawson (National Marine Fisheries Service)

There have been no additional confirmed reports of entangled humpback whales, blue whales, or leatherback sea turtles since the last risk assessment. Therefore, the [December 7, 2022](#) Available Data document still represents the best available information regarding current entanglements in the 2022 and 2023 calendar years. The only exception is that 202220526Mn has now been classified as a confirmed entanglement with unidentified gear by NFMS. Current totals for the calendar year of 2023 are 0 and 16 for the previous

calendar year, 2022. In 2022, there were 16 confirmed humpback whale entanglements reported off California (seven in known gear types and nine in unidentified gear types), with 12 reports originating in Fishing Zone 4, two reports in Fishing Zone 6, and one in Fishing Zones 1 and 3 (Table 1). This data is available for review in the [December 16, 2022 Available Data](#) document.

Table 1. Actionable Species Entanglements 2023, prepared by West Coast Region.

Actionable Species	Number Confirmed Entanglements in California Commercial Dungeness Crab Gear	Number Confirmed Entanglements in Unknown Fishing Gear Reported off California
Humpback whales	0	0
Blue whales	0	0
Leatherback sea turtles	0	0

There have been no reported entanglements in the 2023 calendar year in Dungeness crab or unidentified gear.

Table 2. Impact Score Calculations based on Confirmed Entanglements in California commercial Dungeness crab gear and confirmed entanglements in Unknown Fishing Gear reported off California.

Actionable Species	Current Fishing Season Impact Score (2022-23)	Current Calendar Year Impact Score (2023)
Humpback whales	0	0
Blue whales	0	0
Leatherback sea turtles	0	0

The total calendar year impact score for 2021 was 1.89 for humpback whales and 0 for blue whales and leatherback sea turtles. The total calendar year impact score for 2022 was 4.53 for humpback whales and 0 for blue whales and leatherback sea turtles. The total calendar year impact score for 2023 is 0 for humpback whales, blue whales, and leatherback sea turtles.

Table 3. Impact Score Calculations based on Confirmed Entanglements in California commercial Dungeness crab gear and confirmed entanglements in Unknown Fishing Gear reported off California underlying calculation of a 3-year rolling average.

Actionable Species	2021 Calendar Year Impact Score	2022 Calendar Year Impact Score	2023 Calendar Year Impact Score	3-Year Rolling Average
Humpback whales	1.89	4.53	0	2.14
Blue whales	0	0	0	0
Leatherback sea turtles	0	0	0	0

Marine Life Concentrations: §132.8(c)(1)

Data provided by: Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC).

Table 4. Summary of available CDFW-approved survey data for marine life concentrations for each Fishing Zone, and whether the triggers established in Section 132.8(c)(2) have been met for any Fishing Zone.

Fishing Zone	CDFW-approved survey data	Triggers attained?
Zone 1	NA; pre-season risk assessments complete	NA
Zone 2	NA; pre-season risk assessments complete	NA
Zone 3	None: No surveys conducted due to poor weather	NA
Zone 4	MBWW	No
Zone 5	None: No surveys conducted due to poor weather	NA
Zone 6	None: pre-season risk assessments complete	NA

Monterey Bay Whale Watch (Fishing Zone 4)

- Monterey Bay Whale Watch conducted whale-watching trips in southern Monterey Bay on four of seven days during the week of December 27 2022- January 2, 2023.
- The average number of humpback whales-per-trip during the four days that had trips within the last seven days (27 December 2022 – 2 January 2023) was 2.4, with a peak of 11 whales observed on a single half-day trip on 28 December 2022.
- The semi-monthly average number of whales-per-half-day-trip is above the average historical value at this time of the year (Figure 1), but near seasonal lows. The 7-day running average has continued to decrease during the last two weeks (Figure 2) as more whales have migrated south to their breeding grounds.
- One blue whale was observed by Monterey Bay Whale Watch on 18 December 2022, but none have been observed since that date.

Monterey Bay Whale Watch: Humpback whales per 1/2-day trip (Nov 15, 2016 - Jan 2, 2023)

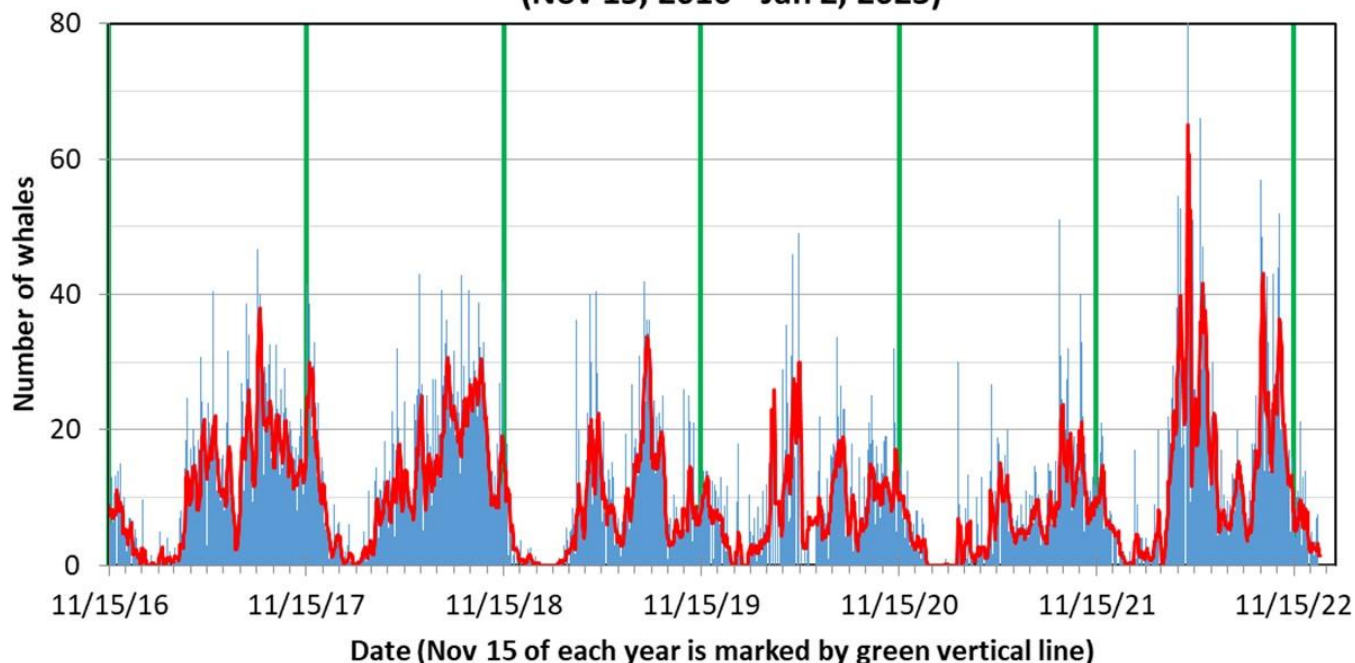


Figure 1. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from 15 November 2016 – 02 January 2023. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns a bit easier to see. A vertical green line has been added on November 15 of each year for reference. Each tick mark is one month.

NMFS Aerial Survey

No surveys were performed during this risk assessment period due to inclement weather. Please reference the [December 16, 2022](#) Available Data document for the most recent surveys.

Cascadia Small Vessel Surveys

No surveys were performed during this risk assessment period due to inclement weather. Please reference the [December 16, 2022](#) Available Data document for the most recent surveys.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

No additional information was provided for this Risk Assessment.

Effectiveness of management measures: §132.8(d)(3)

Data provided by: California Department of Fish and Wildlife

The 2023 calendar year does not currently have any reported entanglements and the 2022 calendar year saw a high number of confirmed entanglements. Avoidance of any

additional entanglement is a priority for CDFW. The recommended management measure must limit the potential for interactions between the humpback whales and commercial Dungeness crab gear to minimize risk of additional entanglements. CDFW will put forward it's recommended approach in the January 9, 2023, Initial Assessment.

Total economic impact to the fleet: §132.8(d)(4)

Data provided by: California Department of Fish and Wildlife

The RAMP regulations specify that, when deciding amongst multiple management measures which would equivalently reduce entanglement risk, CDFW shall consider total economic impact to the fleet and fishing communities. CDFW will provide this evaluation in the January 9, 2023 Initial Assessment.

Historic patterns and current Actionable Species migration: §132.8(d)(6) and (11)

Data provided by: Monterey Bay Whale Watch (processed by Karin Forney, NFMS) Point Blue Conservation Science, NOAA Coast Watch.

Monterey Bay Whale Watch (Fishing Zone 4)

The semi-monthly average number of whales-per-half-day-trip is above the average historical value at this time of the year (Figure 2), but near seasonal lows. The 7-day running average has continued to decrease during the last two weeks.

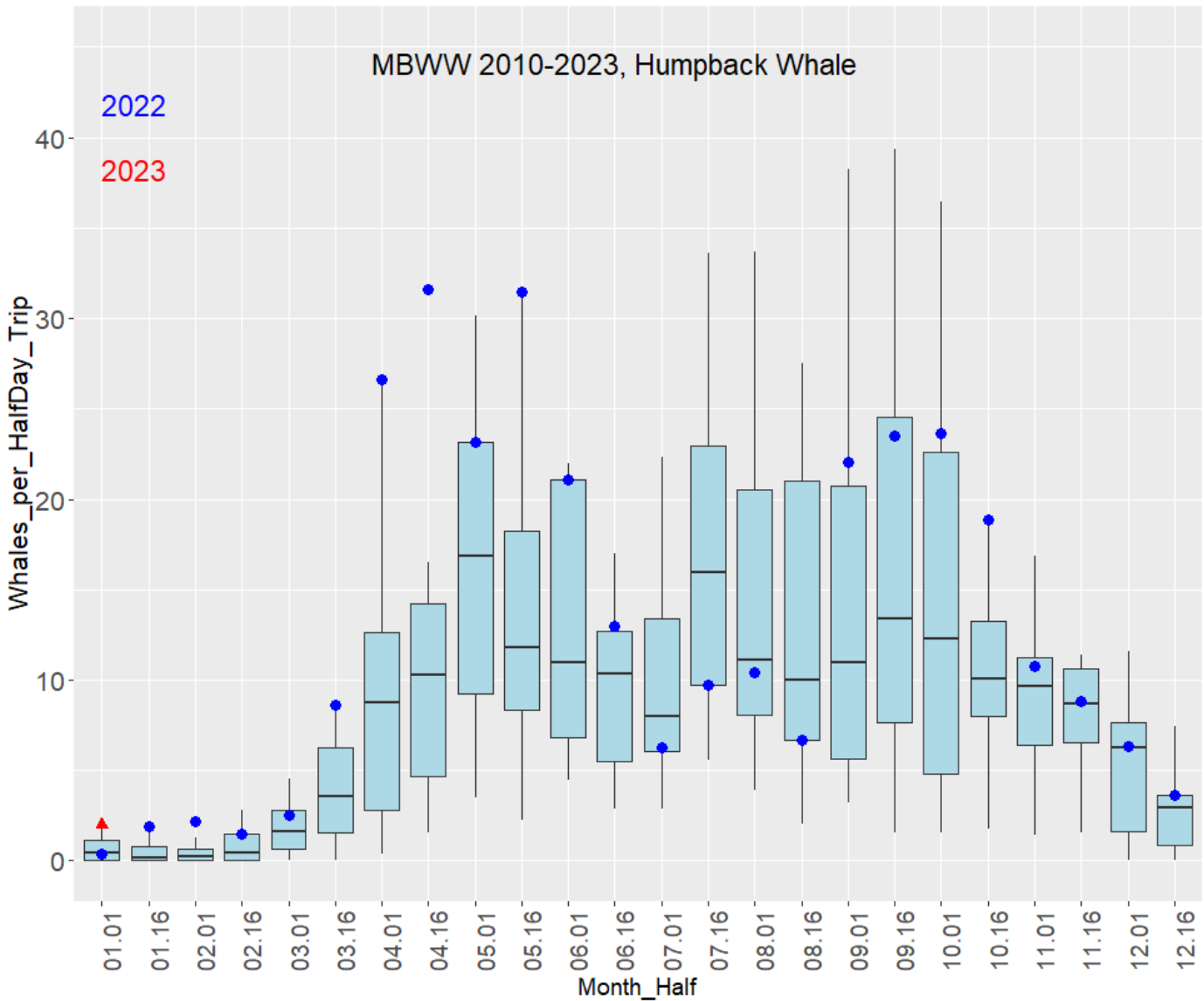


Figure 2. Historical Monterey Bay Whale Watch data for 2010-2023, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average number of whales; the blue box shows the 25th-75th percentiles (i.e., half of all past whale numbers are within the blue box); the vertical lines show the range of whale numbers excluding outliers, and outliers are shown as small black dots. Values for 2022 (large blue dots) and 2023 (red triangles) and are provided for reference, placing recent whale numbers in a historical context.

Point Blue Conservation Science Data Portal (Fishing Zone 6)

During the seven-day period ending January 6, 2022, trained observers from the Channel Islands National Marine Sanctuary and National Park Service reported three humpback whales in Fishing Zone 6 (Figure 3).

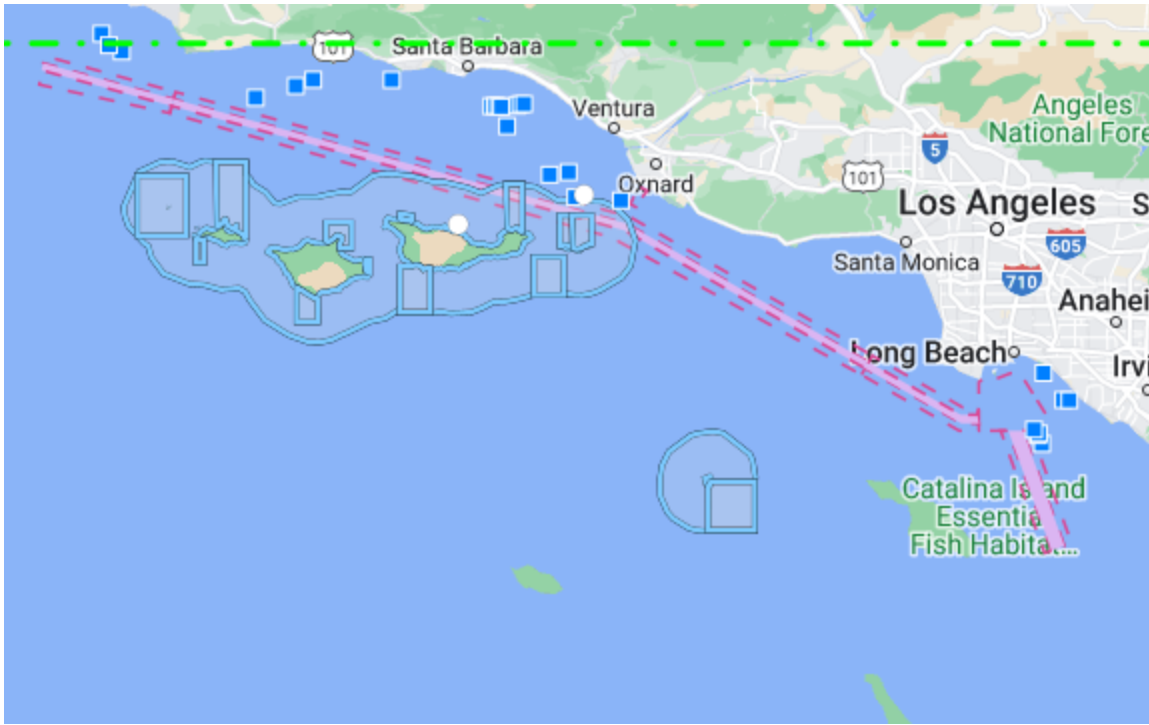


Figure 3. Locations of humpback whale sightings within Fishing Zones 3 and 6. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals. Fishing Zone boundaries are represented by the dashed lines.

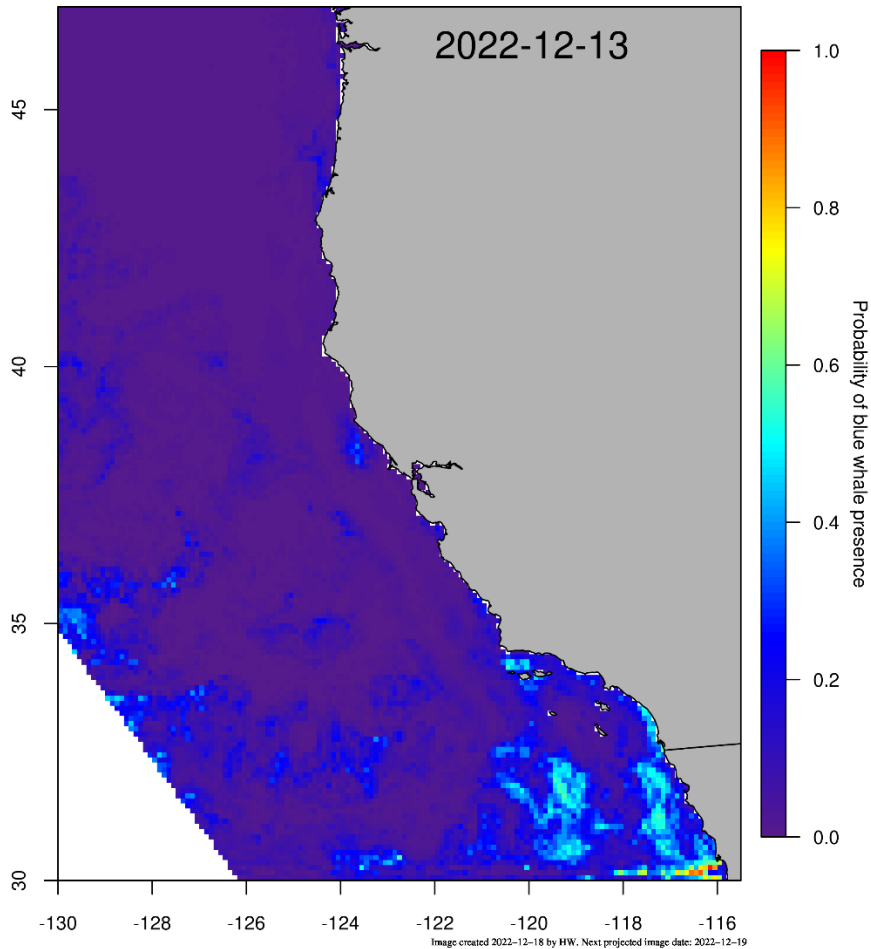
WhaleWatch 2.0 (All Fishing Zones)

Blue whale habitat predictions for December 12, 2022, show low habitat suitability in Fishing Zones 1-6(Figure 4).

WhaleWatch 2.0



Experimental Product



WhaleWatch 2.0 [or future product name] is a dynamic ocean management tool that aims to provide information on suitable whale habitat in real-time to minimize ship strike risk. Map shows predicted daily blue whale habitat suitability at 10km resolution which represents where whales are most likely to be based on environmental conditions. ([link to website](#))

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Figure 4. WhaleWatch 2.0 map for December 13, 2022. [View a current map.](#)

Fishing Season dynamics: §132.8(d)(7)

Data provided by: California Department of Fish and Wildlife

All Fishing Zones are open as of December 31, 2022 and are not subject to any additional delays due to domoic acid or quality.

CDFW data presented in this section is preliminary and subject to revision.

Marine Landings Data System (Zones 3-6)

All Fishing Zones are open as of December 31, 2022 and Fishing Zones 3 through 6 opened under a 50% gear reduction. No ongoing fishing activity is recorded from Fishing Zones 1 and 2, so a summary of landings from Fishing Zones 3-6 is provided (Table 5).

Table 5. Summary of fleet dynamics information for Zones 3-6 as of January 6, 2023. Accessed from CDFW's Marine Landings Data System database on January 6, 2023.

Metric	Value	Additional Info
Season status	Open	All Fishing Zones are open only Fishing Zones 3-6 have ongoing activity since season opened.
Number of daily landings	177	NA
Total volume (pounds)	555,833	NA
Total Ex-Vessel Value	\$1,789,878	NA
Average unit price	\$3.69	NA
Total number of active vessels	93	NA
Maximum potential traps at 50% (based on active permits)	13,982	Estimates are also provided in the Bi-Weekly Fishing Activity Reports subsection.

Bi-Weekly Fishing Activity Reports (Fishing Zones 3-6)

- CDFW has received bi-weekly reports for the first and only reporting period of January 1, 2023. Although total reports for each period may not reflect all permitted vessels participating in the fishery, a summary of this report period is provided (Table 6).
- The January 1, 2023 reporting period covers fishery participation from December 28-31, 2022, and about 7,080 traps are estimated to be deployed with the majority of these located within Fishing Zone 3 and none reported in Fishing Zones 1 and 2.

Table 6. Summary of information for the January 1, 2023 bi-weekly reporting period by Fishing Zones (1-6). Accessed from CDFW's Bi-Weekly Reporting database on January 6, 2023. NR-C refers to data withheld due to confidentiality and all data are preliminary and subject to change.

Fishing Zone	Permits Reporting	Avg. Trap Number	Total Traps	Avg. Min. Depth (fa.)	Avg. Max. Depth (fa.)	Max. Depth (fa.)	Final Report	Number of Lost Traps
Zone 1								
Zone 2								
Zone 3	43	147	6,312	21	34	80	0	
Zone 4	7	110	768	22	47	75	0	
Zone 5								
Zone 6								
Totals	50		7,080				0	

Recreational Crab Fishery

See the [December 7, 2022 Available Data](#) document.

Distribution and abundance of key forage: §132.8(d)(8)

Data provided by: Monterey Bay Aquarium Research Institute

MBARI Krill Model

Modeled zooplankton conditions for December 2022 indicate expected concentrations from the CA/OR border to Point Arena, expected to higher than expected concentrations to Point Sur, higher than expected concentrations between Point Sur and Point Conception, and average or below average concentrations south of Point Conception (Figure 5).

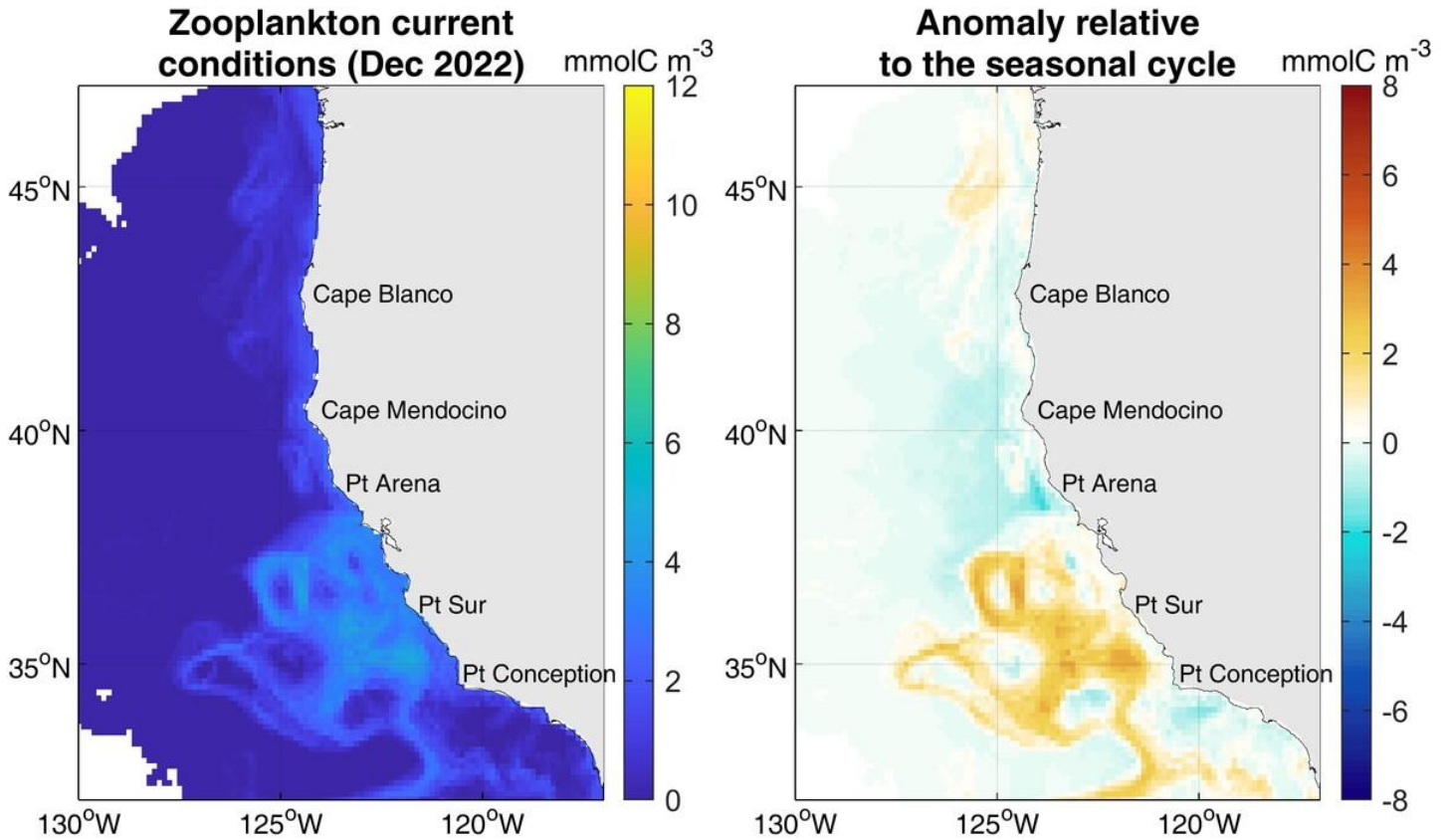


Figure 51. Latest modeled zooplankton concentrations in the California Current (left) and corresponding anomaly relative to the 1993-2018 seasonal cycle (right). Accessed from the [MBARI website](#) on January 6, 2022.

The MBARI model identified four zooplankton hotspots within the model's spatial domain, three of which are present within California (Figure 6). The southernmost hotspot (north of Point Conception, 34.5 to 36° N) is most productive between May and July. The central hotspot (which extends from Point Sur to Point Arena, 36.3 to 38.9° N) is most productive during June and July, and the northern hotspot (which extends from Cape Mendocino to Cape Blanco, 40.4 to 42.8° N) is most productive during July and August.

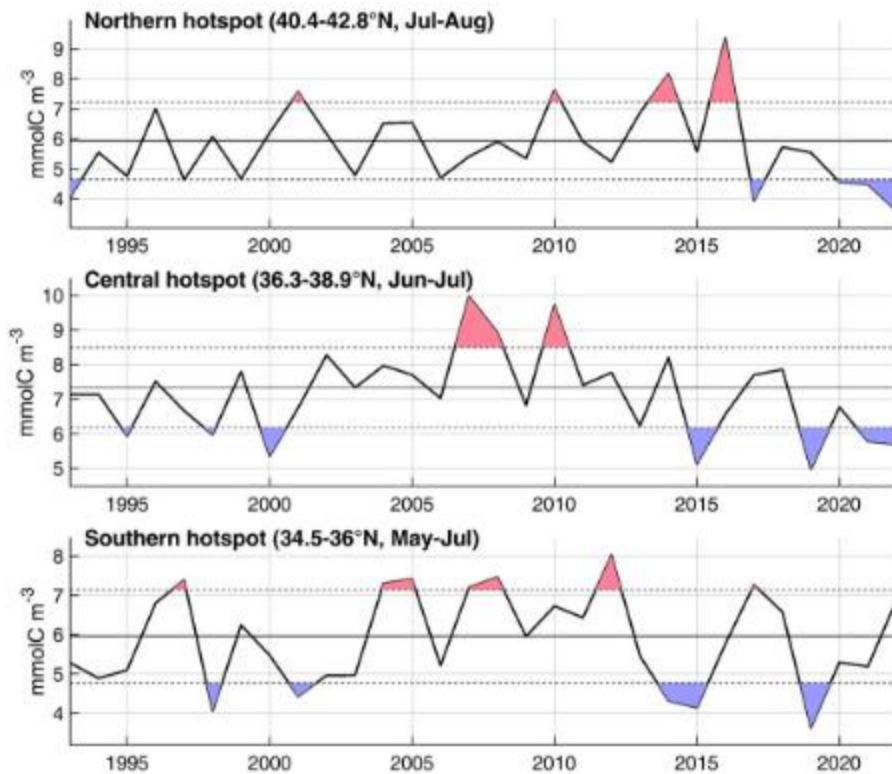


Figure 62. Time series of zooplankton concentration within three hotspots off California, averaged each year over their peak months. Horizontal lines display the mean and standard deviation over the 1993-2018 time period. Ocean conditions: §132.8(d)(9).

Ocean conditions: §132.8(d)(9)*

Data provided by: California Current Integrated Ecosystem Assessment Program.

El Niño/Southern Oscillation (ENSO) Diagnostic

La Niña is expected to continue into the winter, with equal chances of La Niña and ENSO-neutral during January-March 2023. In February-April 2023, there is a 71% chance of ENSO-neutral.

Large Marine Heatwave Tracker

As of December 12, 2022 the heatwave has receded from nearshore coastal waters, returning to normal or slightly colder-than normal temperatures (Figure 7).

Dec-16-2022

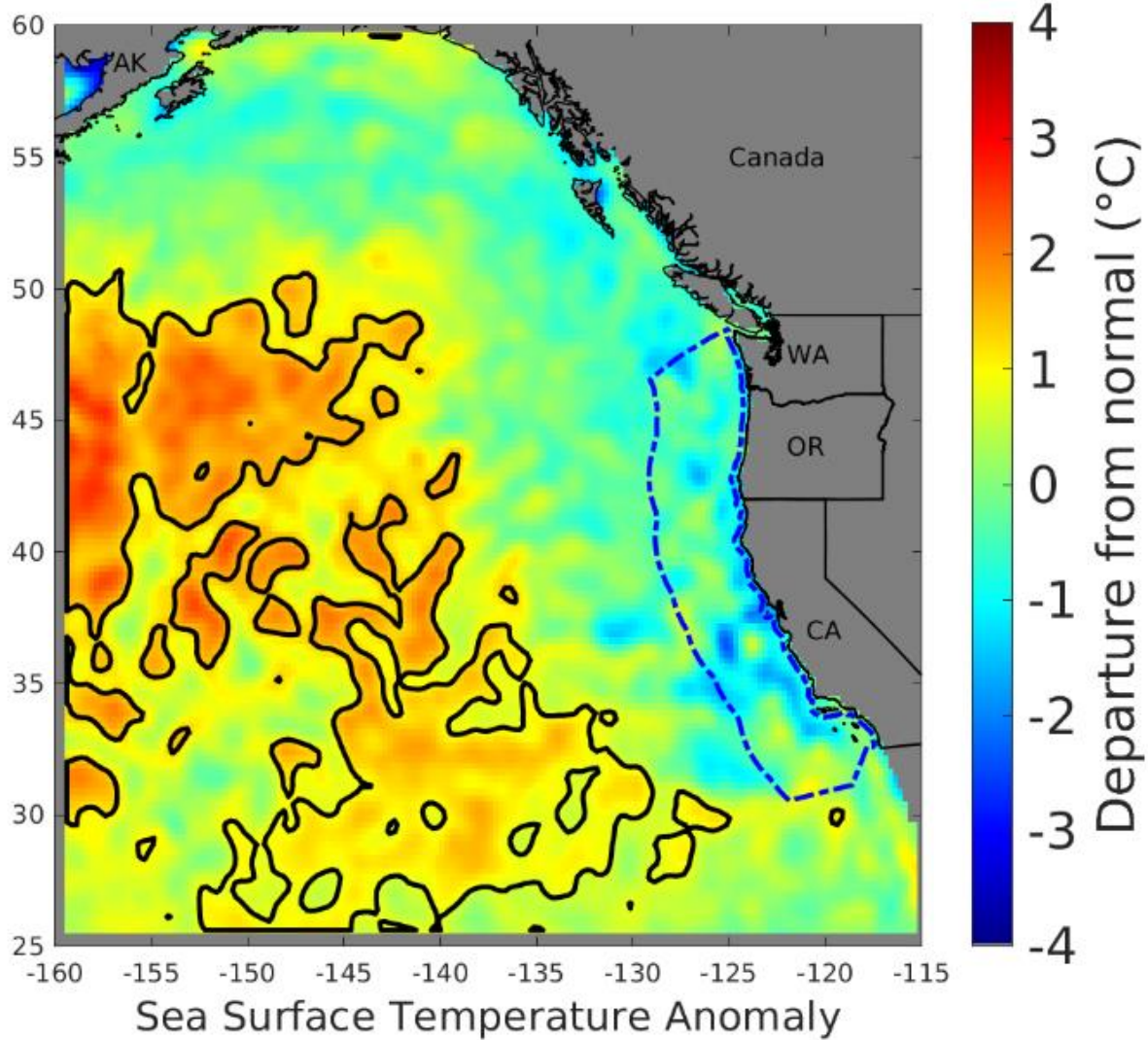


Figure 73. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTA) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 SD from normal. Blue dashed line represents the US West Coast EEZ. SST data from [NOAA's Optimum interpolation Sea Surface Temperature analysis](#), with the SST anomaly calculated using climatology from NOAA's AVHRR-only OISST dataset.

Habitat Compression Index

See the [December 7, 2022, Available Data](#) document.

Current Impact Score Calculation: §132.8(d)(10)

Data provided by: California Department of Fish and Wildlife

Pursuant to the Risk Assessment and Mitigation Program (Section 132.8, Title 14, CCR), Impact Score Calculations will be assigned beginning with the 2021 calendar year based on confirmed entanglements of Actionable Species (humpback whales, blue whales, or

leatherback sea turtles) reported to CDFW by NOAA. Impact Score totals for the current fishing season (2022-23) and calendar year (2023) are provided in Table 2 above. Impact Score totals for calendar year 2021-2023 are provided in Table 3 above.