2019-20 Risk Assessments: Available Data

Last updated: June 9, 2020*

FACTOR: OCEAN AND FORAGE CONDITIONS

Information provided by: Jarrod Santora and Isaac Schroeder (NMFS SWFSC and UC Santa Cruz)

Ocean and Forage Indices

The Habitat Compression Index (HCI) in May 2020 is slightly below the long-term mean, indicating less cool habitat area and increased likelihood of moderate compression of cool upwelled water closer to the coast (Figure 1). The HCI map (Figure 2) indicates cooler waters to the north (38˚N), but temperatures are still anomalously warmer in the south (38˚-35˚N). The regional cool (north) and warm (south) has persisted the past several months, but there is now moderate habitat compression present in the central California offshore region. This change in temperature and weakening of cool habitat may increase the likelihood of whales concentrating closer to the coast, especially in the central coast region.

The regional temperature and HCI conditions are reflective of and impacted by broader ocean conditions in the North Pacific Ocean. Maps of sea-surface temperature anomalies indicate there are warming ocean conditions (positive values) further offshore and anomalously warm temperatures have continued to persistent the past few months within the southern California Bight (Figure 3).

Temperature patterns are known to influence regional distribution patterns of forage. Across California, this strong regionalization of temperature and upwelling conditions may reflect different regional feeding conditions for whales. Furthermore, anchovy abundance continues to remain high and patchy throughout the central California Current Ecosystem and aggregations of feeding whales associated with anchovy should be anticipated.

* Minor edits were made to correct errors noted during the June 9, 2020 discussion.

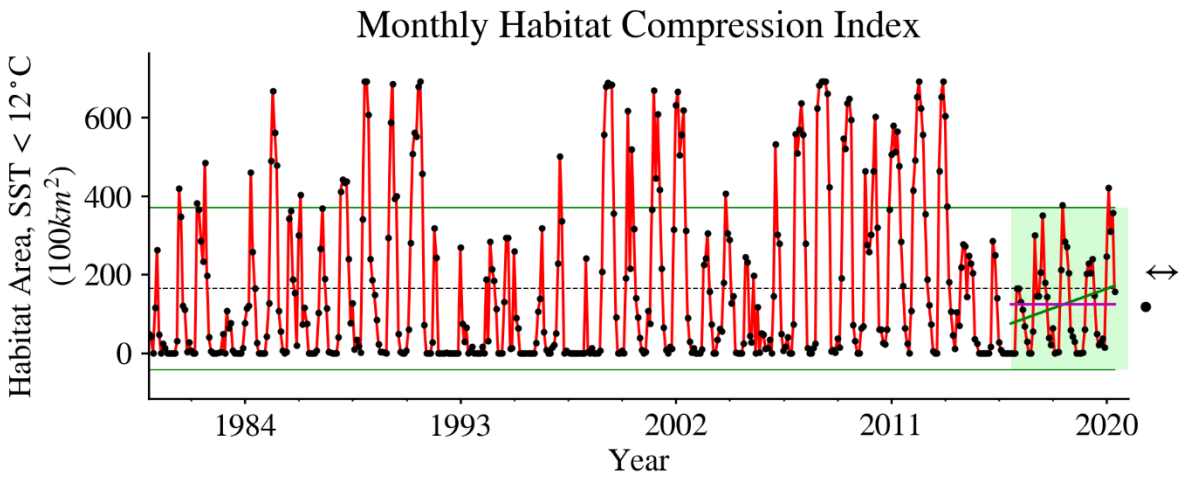

Figure 1. Monthly Habitat Compression Index (HCI). Positive values indicate increased area of cool water habitat.

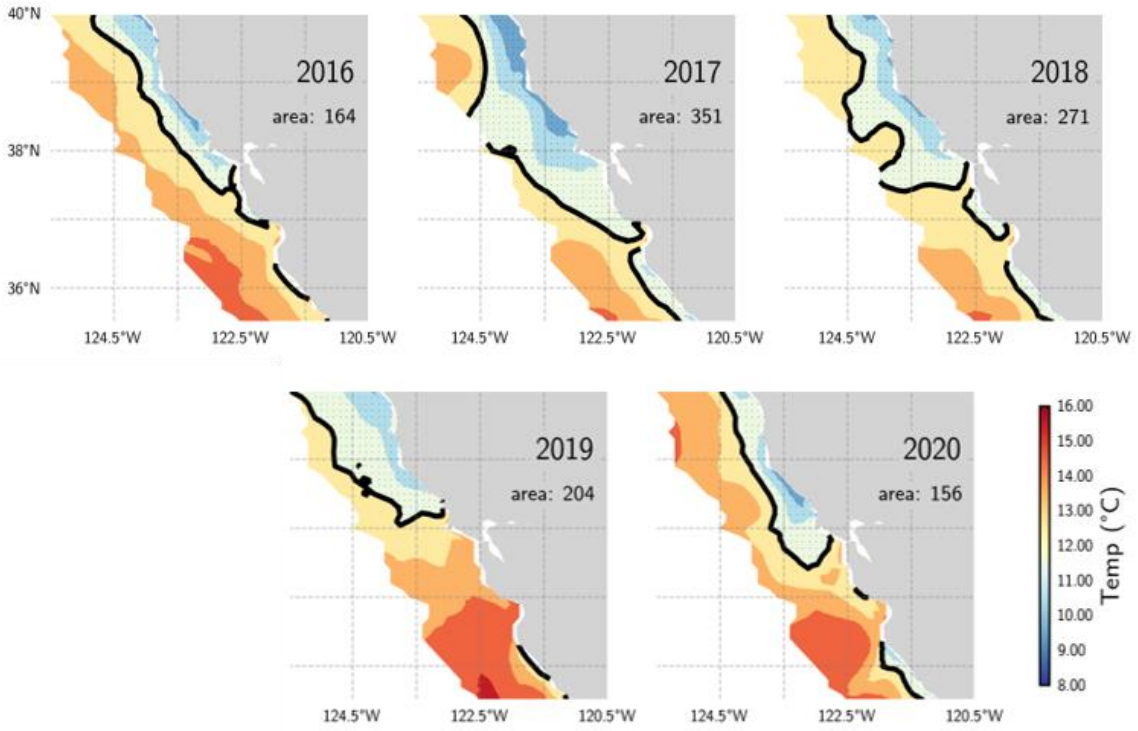

Figure 2. Maps of May sea surface temperature and location of HCI boundary (black line) indicating the amount of cool surface water during the past 5 years.

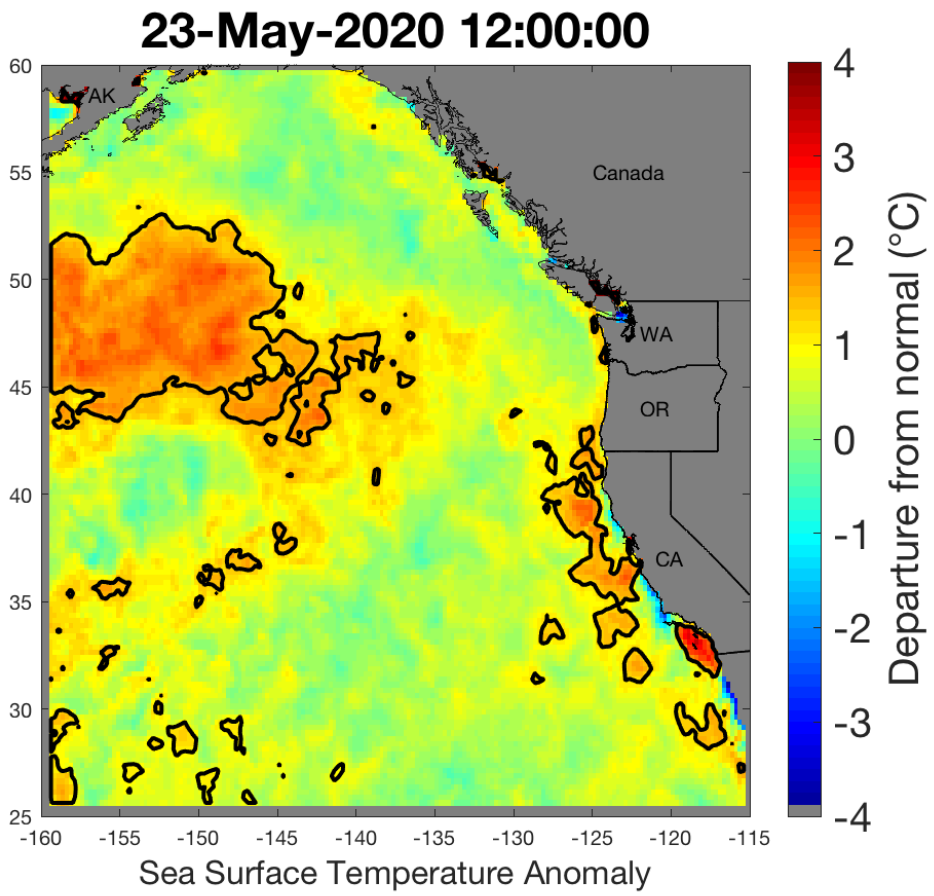

Figure 3. Provisional daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem. Dark outline shows the current extent of the Northeast Pacific Marine Heatwave of 2020, or NEP20, off the US West Coast and Gulf of Alaska, as delineated by values of the normalized SSTa > 1.29 standard deviations from normal. SST data from NOAA's Coral Reef Watch program (https://coralreefwatch.noaa.gov/satellite/index.php), with the SST anomaly calculated using climatology from NOAA's OISST dataset. Figure info from: https://oceanview.pfeg.noaa.gov/images/mhw/regular_ssta_prov_current.png

FACTOR: ENTANGLEMENTS

Data provided by: Lauren Saez and Dan Lawson (NMFS)

California Commercial Dungeness Crab Gear

- There has been 1 confirmed humpback whale entanglement with California commercial Dungeness crab gear during the 2019-20 fishing season.

2020 Calendar Year Totals

- Totals for calendar year 2020: 8 confirmed (5 humpback, 3 gray whales), 4 unconfirmed (3 gray, 1 unidentified whale)
    - Humpback whales: 5 confirmed entanglements

        - May 16, 2020: entangled with multiple sets of commercial CA Dungeness crab gear, reported off Moss Landing, fully disentangled
        - April 15, 2020: calf entangled with unidentified gear (likely gillnet), reported off Orange County
        - April 13, 2020: entangled with spot prawn gear set, reported off Channel Islands, partially disentangled
        - February 28, 2020: entangled with unidentified gear (dark colored line), reported off Monterey
        - February 14, 2020: entangled with gillnet, reported off San Diego
    - Blue whales: 0 reported entanglements
    - Leatherback turtles: 0 reported entanglements
    - Gray whales: 3 confirmed, 3 unconfirmed
        - 1 confirmed entanglement with WA commercial Dungeness crab gear, reported in Washington (April 24)
        - 1 confirmed entanglement with gillnet reported off San Diego (January 20)
        - 1 confirmed entanglement with unidentified gear reported off Oxnard (January 12)
        - 1 unconfirmed entanglement with rope + 1 buoy + 1 trailer float, reported in Washington, dead stranding (May 10)
        - 1 unconfirmed entanglement with a mooring buoy, report in Washington (April 29) *has not been reviewed yet*
        - 1 unconfirmed entanglement with unidentified gear, reported as buoys (March 19)
    - Unidentified whale: 1 unconfirmed entanglement (March 3)

FACTOR: FISHING DYNAMICS

Data provided by: California Department of Fish and Wildlife and Jon Gonzalez (California Coast Crab Association)

Marine Landings Data System and Automated License Data System

- All analyses were conducted with landing receipt data available as of June 5, 2020. Submission requirements through the E-Tix platform and subsequent availability in the

Marine Landings Data System means data are relatively complete through late-May; only landings through May 30, 2020 (Week 24) were included in the totals and figures below.

- During the 2019-20 season, there have been 6,964 landings of Dungeness crab (13,708,274 pounds and $46,439,394 in Ex-Vessel Value) by 434 vessels.
- CDFW MacroBlocks (aggregated CDFW Fishing Blocks used to report catch location) are shown in Figure 4.
- In the Northern Management Area, recent vessel activity has tended to be highest in Crescent City or Trinidad, although during the week of May 24 activity was highest in Eureka and Fort Bragg (Figure 5). There has been no recent vessel activity in the Central Management Area due to the May 15 closure.
- Recent landings have been highest in Eureka and Fort Bragg (Figure 6) with the highest harvest from MB.1040 and MB.1041 (Figure 7).
- Number of deployed traps is estimated by summing the number of allotted traps (i.e. trap tier) for each permitted vessel making a landing during the specified time period. Overestimation may occur if a vessel does not utilize their full trap allocation. Underestimation may occur if a vessel has traps deployed but does not make a landing during that time period or if a vessel number was incorrectly reported on a landing receipt (preventing assignment of the vessel's trap allocation). Incorrectly reported catch locations (blocks) will also generate discrepancies. Within these constraints, the estimated number of deployed traps during the week of May 24 was at least 7,175 traps (Table 1). Summed across all MacroBlocks, the estimated number of deployed traps during this week is approximately 6% of those deployed during the first week when both management areas were open.

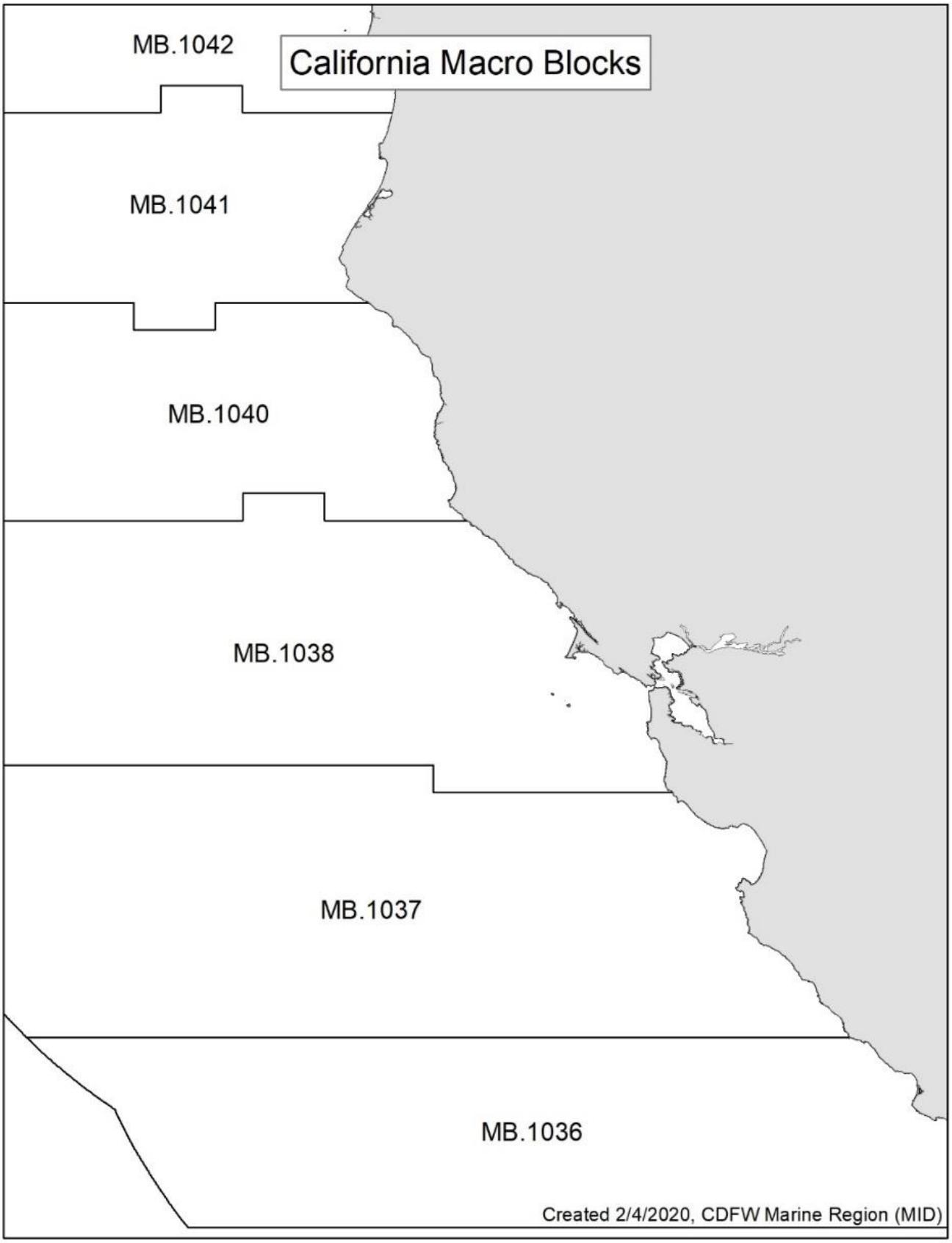

Figure 4. Map showing spatial extent of MacroBlocks used for summarizing landings analysis.

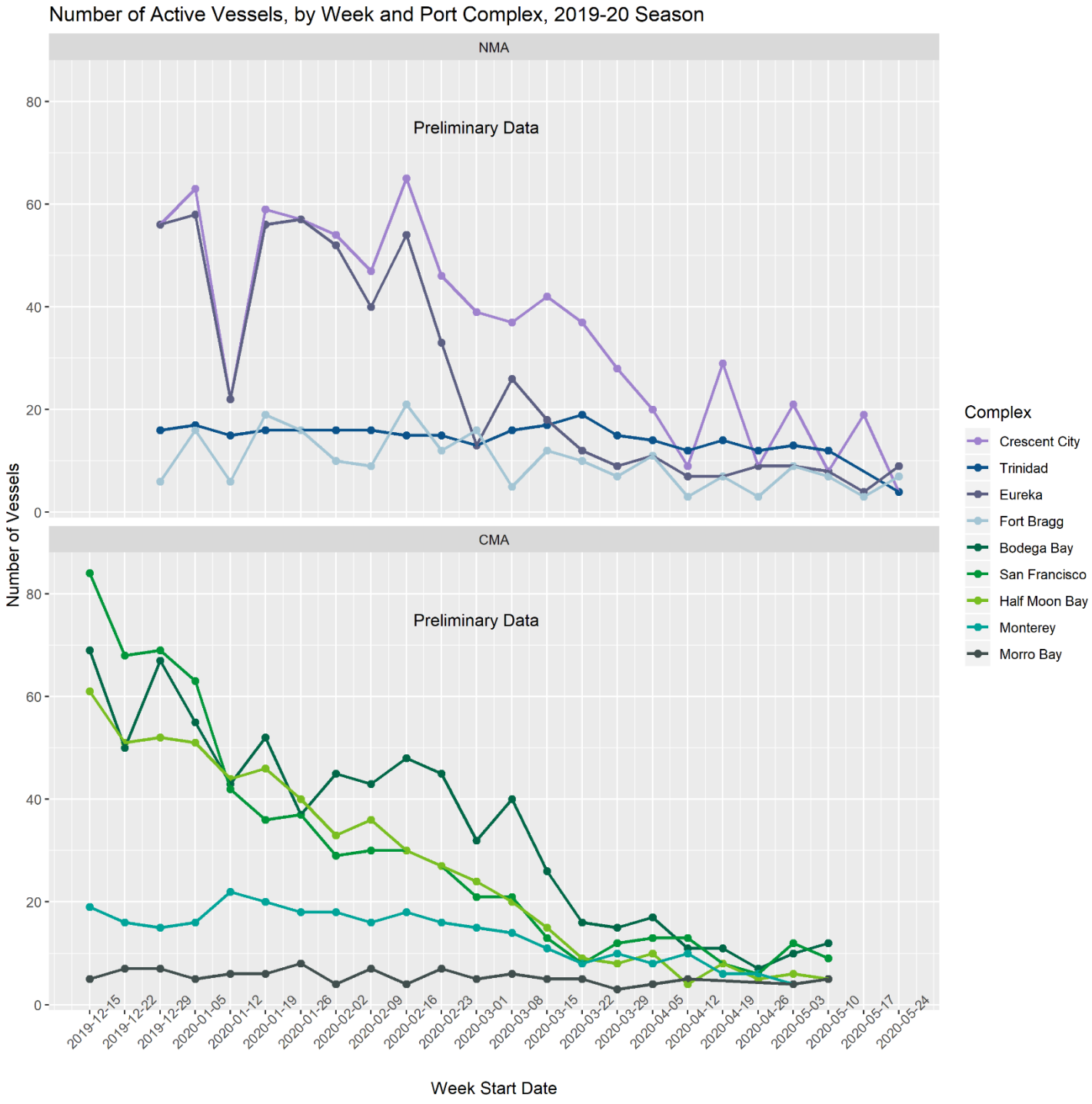

Figure 5. Number of vessels making Dungeness crab landings by week and port complex. Accessed from CDFW's Marine Landings Data System on June 5, 2020. All data is preliminary and subject to change.

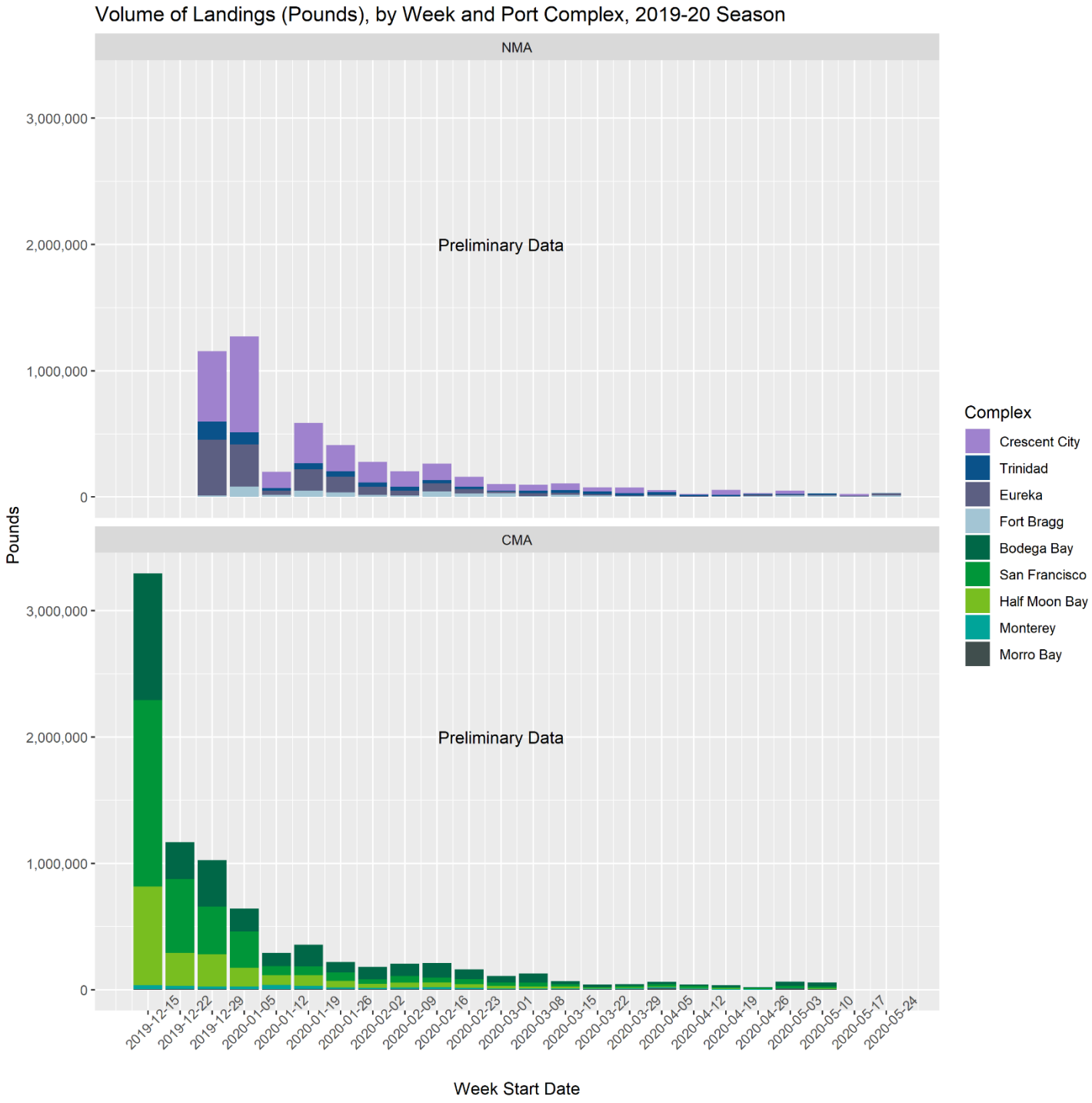

Figure 6. Dungeness crab landings (pounds) by week and port complex. Accessed from CDFW's Marine Landings Data System on June 5, 2020. All data is preliminary and subject to change

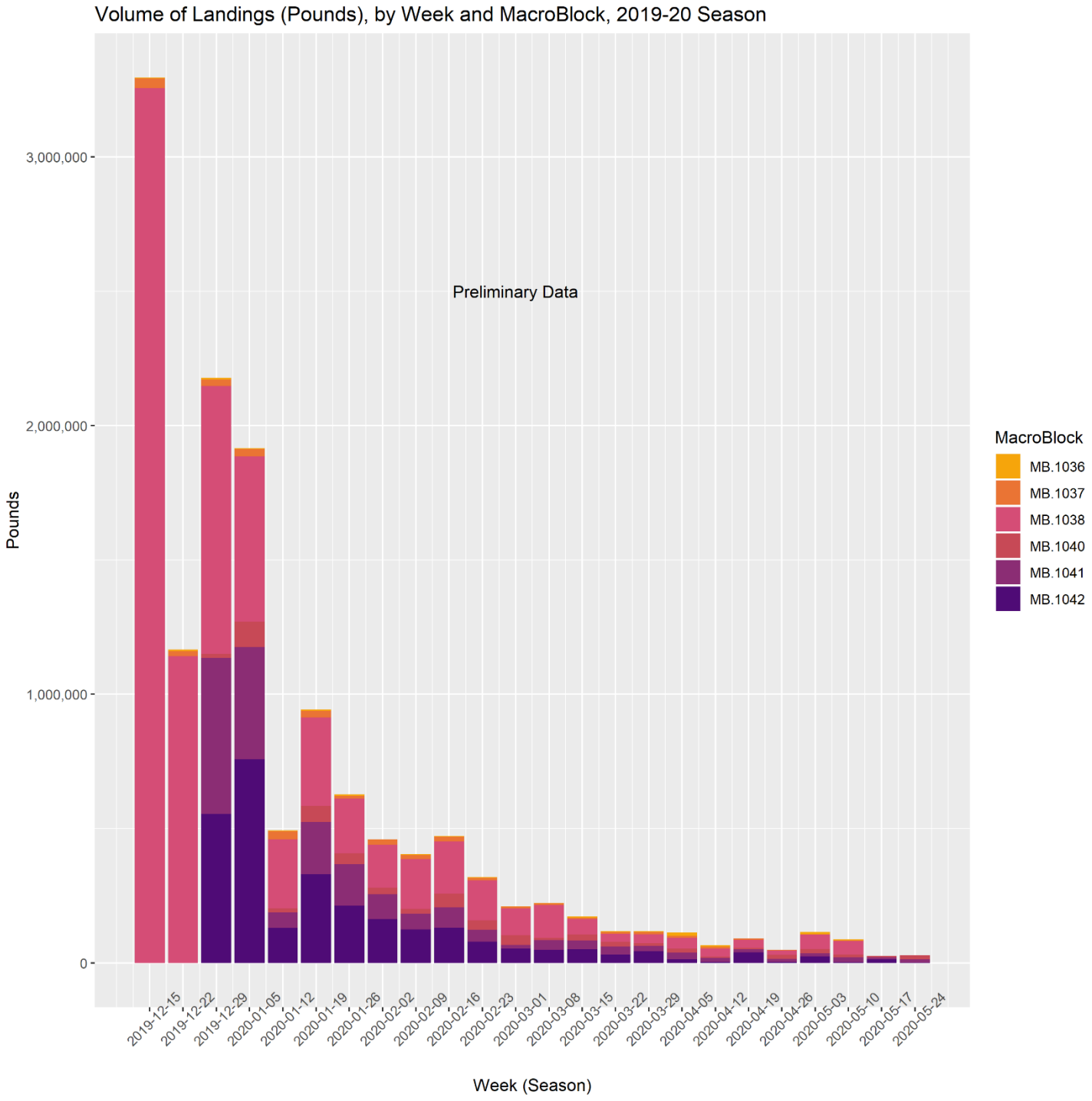

Figure 7. Dungeness crab landings (pounds) by week and MacroBlock. Accessed from CDFW's Marine Landings Data System on June 5, 2020. All data is preliminary and subject to change.

Table 1. Estimated number of Dungeness crab traps deployed in each MacroBlock based on trap allotments of vessels making landings each week. Accessed from CDFW's Marine Landings Data System and Automated License Data System on June 5, 2020. All data is preliminary and subject to change. Information for week and MacroBlock combinations where less than 3 vessels made landings is withheld for confidentiality.

Week of	MB.1036	MB.1037	MB.1038	MB.1040	MB.1041	MB.1042
12/15/2019	1,100	5,675	65,900	season not open	season not open	season not open
12/22/2019	1,725	4,600	53,700	season not open	season not open	season not open
12/29/2019	1,725	4,650	60,675	2,175	24,525	20,425
1/5/2020	1,300	5,350	53,925	5,425	24,625	23,725
1/12/2020	1,300	5,250	39,325	1,600	14,350	8,800
1/19/2020	1,550	5,550	41,350	5,675	22,900	22,725
1/26/2020	1,975	4,425	35,375	5,125	24,550	20,925
2/2/2020	1,050	5,400	33,100	3,675	22,600	19,550
2/9/2020	1,725	4,575	32,775	2,975	18,600	18,925
2/16/2020	1,050	5,650	32,875	6,475	22,350	24,025
2/23/2020	1,625	4,225	29,425	4,400	14,100	18,000
3/1/2020	1,475	3,850	22,725	4,800	8,400	15,125
3/8/2020	1,550	3,950	25,725	2,225	11,250	14,225
3/15/2020	1,375	2,625	15,500	4,200	11,000	16,100
3/22/2020	1,125	2,175	9,925	3,575	10,025	13,725
3/29/2020	675	2,350	10,525	3,175	7,225	11,075
4/5/2020	925	1,850	11,550	4,100	6,625	7,250
4/12/2020	1,100	2,625	7,625	2,100	5,825	3,225
4/19/2020	confidential	1,575	7,450	3,150	6,675	9,650
4/26/2020	confidential	1,400	5,050	2,825	5,375	3,750
5/3/2020	925	925	7,575	3,725	6,525	8,050
5/10/2020	1,100	1,100	7,625	2,925	6,475	2,850
5/17/2020	season closed	season closed	confidential	600	2,050	7,300
5/24/2020	season closed	season closed	confidential	2,550	3,225	1,400

California Coast Crab Association (CCCA) Port Survey

- Estimated numbers of vessels and pots were provided to CCCA by trusted port representatives and crab buyers from each major port area (Crescent City, Trinidad, Eureka and Fort Bragg) between June 6 and June 8, 2020 (Table 2).
- Current fishing efforts are not expected to reduce significantly over the next two weeks because most of the folks that stack out for salmon, albacore or shrimp have already done

so. One or two boats may stack out for albacore over the week or two, which would result in 450 or so fewer pots.

Table 2. Estimated number of active commercial Dungeness crab vessels and traps by port area as of June 8, 2020 and projections for June 15, 2020. Provided by California Coast Crab Association. Fort Bragg includes Shelter Cove, Point Arena, and Noyo.

Port	Vessels as of June 8, 2020	Traps as of June 8, 2020	Projected Vessels on June 15, 2020	Projected Traps on June 15, 2020
Crescent City	24	5,400	23	4,950
Trinidad	7	1,945	7	1,945
Eureka	8	2,250	8	2,250
Ft. Bragg	15	5,200	15	5,200
Statewide	54	14,795	53	14,345

FACTOR: MARINE LIFE CONCENTRATIONS

Data provided by: Scott Benson (NMFS SWFSC), Monterey Bay Whale Watch (compiled by Karin Forney, NOAA SWFSC), Point Blue Conservation Science

Leatherback Sea Turtle Tagging Data

Three of six transmitters that were attached to leatherback turtles during September/October 2019 remain active. All three turtles are currently moving toward the California coast, traveling in a northeast direction, but remain outside of shelf waters. The turtle closest to the coast is 132 miles southwest of Point Sur, California (N34.56 / W123.56). The other two turtles are 330 and 530 miles southwest of Point Conception, California.

The turtle closest to Dungeness crab fishing grounds was engaged in foraging behavior from April 30 to June 1 and has now resumed movement towards the coast. Rather than entering coastal waters in Southern California, it has remained in deep offshore waters while traveling north of Point Conception. Given the turtle's current rate and direction of travel, it could arrive in the Big Sur/Monterey area within 8-10 days. However, it may remain off the shelf longer if it encounters sufficient prey offshore, or cold waters are present in coastal areas.

Point Blue Conservation Science (https://geo3.pointblue.org/whale-map/index.php)

- Observations by trained biologists at the Farallon Islands show 5 humpback whales were reported through the Spotter/WhaleAlert app over the last 30 days (May 6 to June 4; Figure 8) and 5 blue whales over the same period (Figure 9). There were no sightings of either humpback or blue whales in the last 7 days (May 29 to June 4).
- In the Monterey Bay region, 12 humpback whale sightings were reported through the Spotter/WhaleAlert app over the last 7 days (May 29 to June 4; Figure 10), with no blue whales reported over this period.
- Six humpback whale observations by trained naturalists from Channel Islands National Marine Sanctuary and the National Park Service were reported on May 29, 2020.

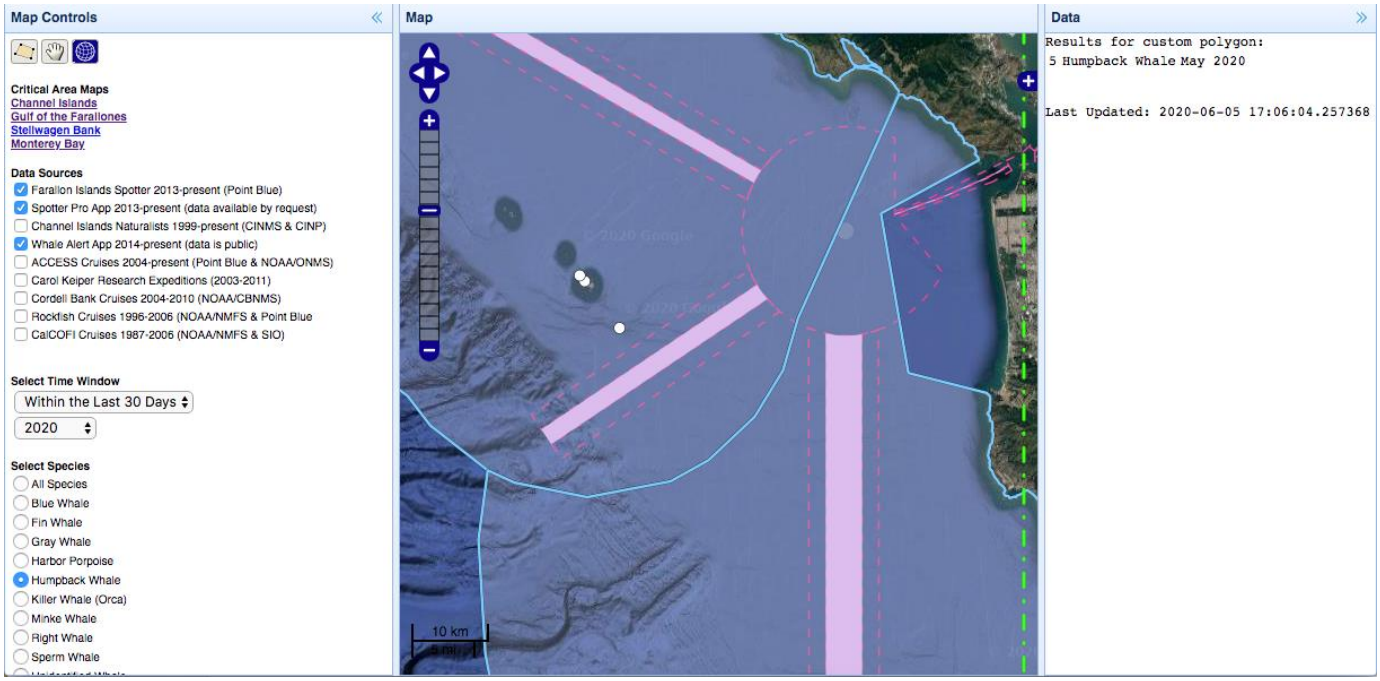

Figure 8. Five humpback sightings in the Gulf of the Farallones from May 6 to June 4, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

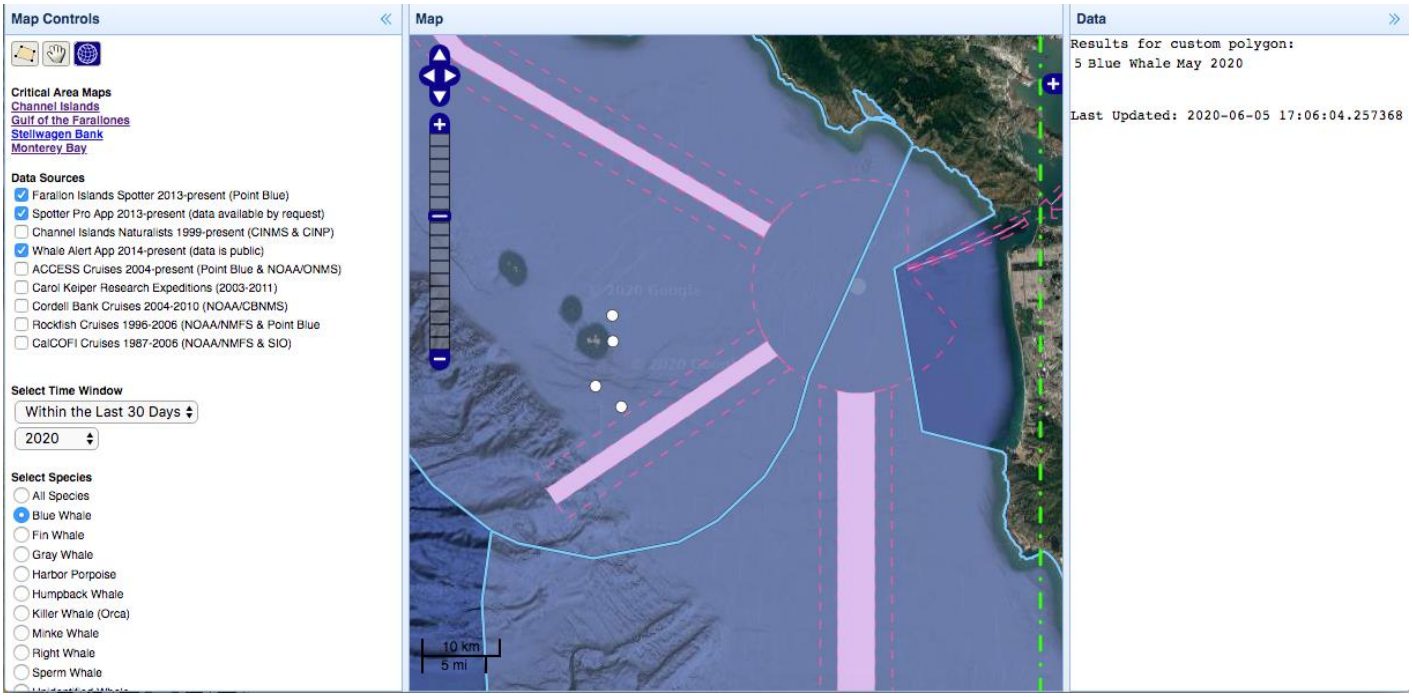

Figure 9. Five blue whale sightings in the Gulf of the Farallones from May 6 to June 4, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

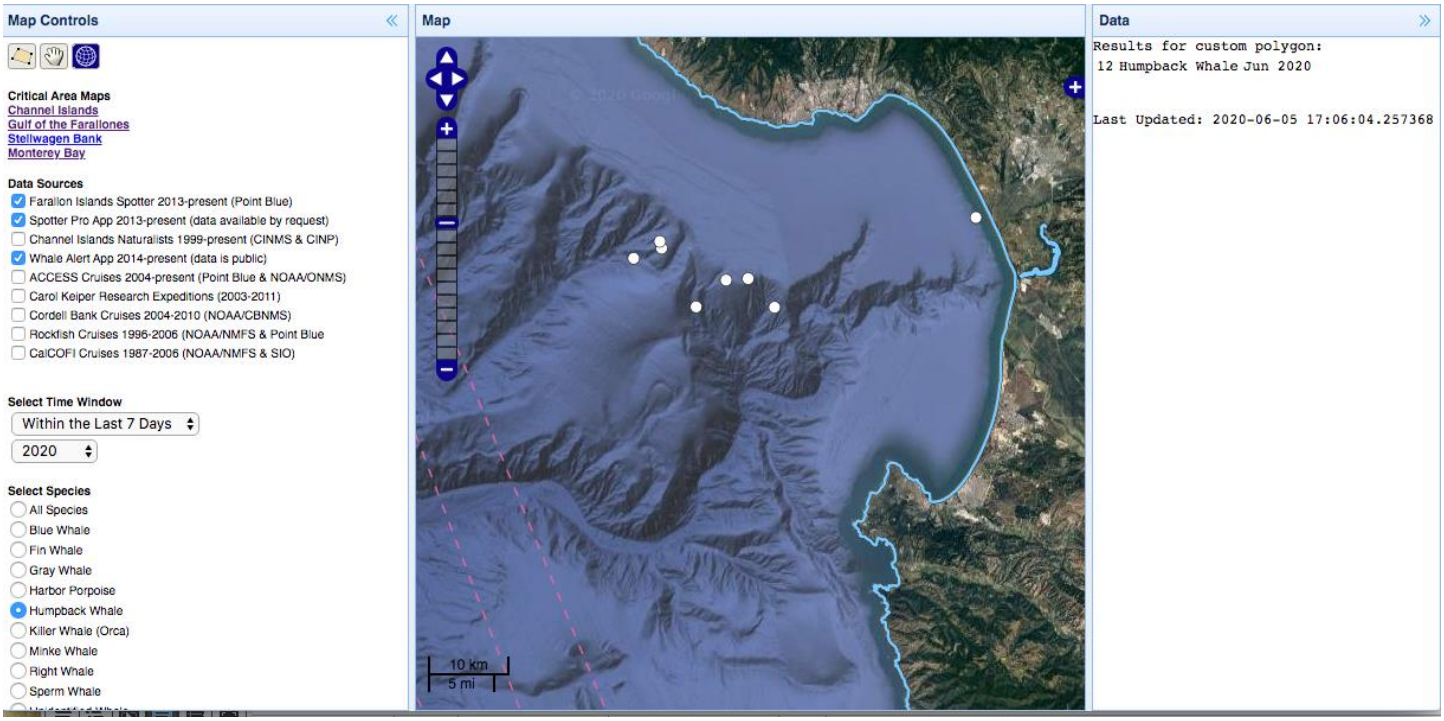

Figure 10. 12 reported humpback sightings in the Monterey Bay area from May 29 to June 4, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals, and the same individual may be included in multiple reports. Right hand panel shows total counts by species and time period. Sightings were reported during research surveys by Nancy Black/Monterey Bay Whale Watch and Peggy Stap/Marine Life Studies.

Monterey Bay Whale Watch (MBWW)

- Commercial MBWW whale-watching trips remain suspended because of COVID-19, but Nancy Black has continued to conduct some research trips through May 31, 2020. Karin Forney has standardized these research trips to the same 'whales per half-day-trip' unit used in previous summaries.
- Nancy Black's research trips have been largely suspended after May 31 because of lack of funds.
- The average number of humpback whales per half-day-trip has dropped from about 24 whales during the seven trips conducted May 1-15, to about 5 whales during five trips conducted May 16-31 (Figure 11). This decrease suggests whales have become less concentrated in Monterey Bay during the second half of the month, and that humpback whales have likely dispersed into other foraging areas.
- No blue whales were observed during May 2020

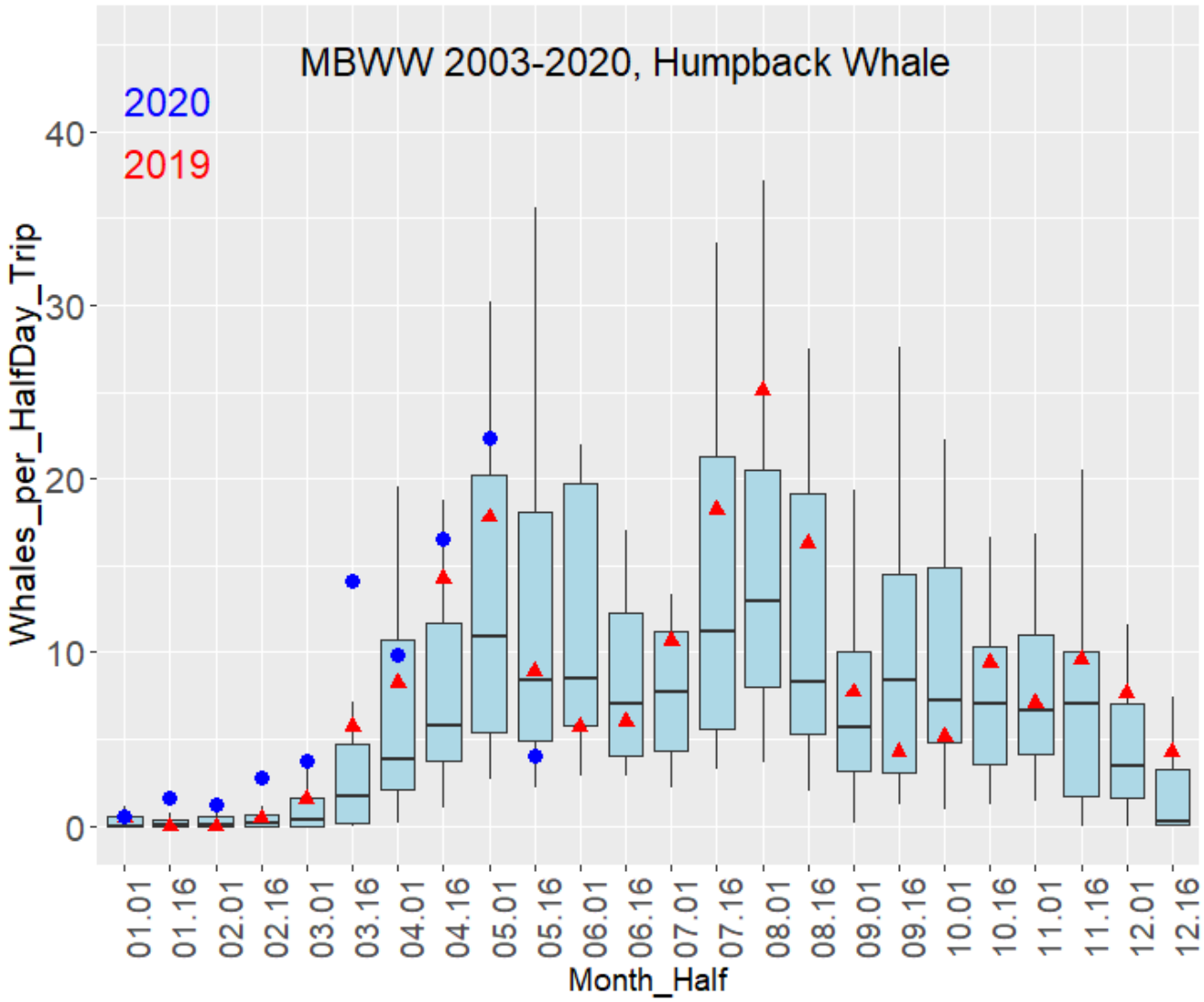

Figure 11. Historical Monterey Bay Whale Watch data for 2003-2020, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is 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 2019 (red triangles) and 2020 (large blue dots) are provided for reference, placing recent whale numbers in a historical context.