

Monterey Bay National Marine Sanctuary (MBNMS)
Vessel Traffic Analysis June 1 to December 21,
2018.

10/21/2019

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Background

Vessel traffic was identified as a major issue of concern during NOAA's Monterey Bay National Marine Sanctuary's (MBNMS) designation process due to potential impacts from a large spill should any vessels collide or ground along the coastline. For example, an oil spill could severely impact the sea otter population. The Sanctuary also hosts an abundance of whales and the National Marine Fisheries Service (NMFS) has identified vessel strikes as one of the threats that could impede the recovery of endangered whales, so it is vital to better understand vessel traffic in MBNMS.

In the 1990's the United States Coast Guard (USCG) and the National Oceanic and Atmospheric Administration (NOAA) established a working group of key stakeholders, to review existing vessel traffic practices and risks, and recommend a package of strategies which would maximize protection of Sanctuary resources while allowing for the continuation of safe, efficient and environmentally sound transportation. The group's recommendations included implementing offshore tracks for container ships, bulk freighters, and vessels carrying hazardous materials to reduce the risk of groundings, and organizing those tracks into north-south lanes to reduce the risk of collision. These recommendations were ultimately approved by the International Maritime Organization (IMO), and implementation began in 2000 (See Figure 1).

In 2013, MBNMS resource protection staff working with a number of partners, including an environmental Non-Governmental Organization (NGO) stakeholder, conducted an analysis on vessel use of the recommended tracks to determine if vessels were adhering to the recommended tracks. By using cargo and tanker navigation data that was made available through USCG and Naval Postgraduate School (NPS) and in partnership with other federal agencies, MBNMS was able to review and evaluate use of IMO recommended track lines over a four-year period from 2009 to 2012. Three different analyses using Automated Information System (AIS) ship traffic data were completed to address this question. The Naval Postgraduate School (NPS) reviewed daily AIS data from September 2009-2012 and found that annually less than 8 individual cargo vessels deviated more than 3 nautical miles inshore of the northbound recommended track for vessels 300 gross tons and above and only one tanker was found deviating from that northbound track in that time-period. A further refinement of the analysis of the tanker traffic would be facilitated by access to data on the association and contents of each vessel because Western States Petroleum Association (WSPA) tankers carry crude oil, black oil, or other persistent liquid cargo in bulk and have agreed to stay more than 50 nautical miles offshore. The Southwest Fisheries Science Center of the National Marine Fisheries Service completed density maps for 2009 AIS data and found that tankers are using the recommended tracks, particularly those designated for vessels carrying hazardous cargo in bulk

with an especially higher density using the southbound track. The 2009 data analysis by the Southwest Fisheries Science Center indicated higher densities of cargo vessels in the northbound recommended track for vessels 300 gross tons and above than in the other three tracks. MBNMS began conducting random daily reviews of AIS data on October 1, 2012 and staff contacted the USCG when a deviation of more than 3 nautical miles inshore of the northbound recommended track for vessels 300 gross tons and above was noted. The USCG verified the AIS data and contacted the vessel if they determined that the AIS data did reflect a deviation. These three AIS analyses did indicate that a great majority of the vessels that transit through the MBNMS are complying with the IMO recommended tracks.

MBNMS staff continued to track vessel traffic, focused on cargo vessels and tankers, after completing the 2009-2012 analysis. In 2017, MBNMS staff set up an account with MarineTraffic and set up a notification structure. MBNMS staff would receive an email every time any vessel entered or left the alert zone which was 1.5 nautical miles east of the northbound IMO vessel track. However, due to the bulk of emails received, analysis of those deviations was not possible. Starting June 1 of 2018, the notification alerts from MarineTraffic were refined to alert MBNMS staff only when tankers or cargo vessels deviated more than 1.5 nautical miles (nm) east of the Northbound track (note that for the 2009-2012 analysis, we used 3 nm). This report focuses on analyzing the AIS data received from the notifications and collected from MarineTraffic between June 1, 2018 and December 21, 2018.

Figure 1. International Maritime Organization recommended tracks within Monterey Bay National Marine Sanctuary. The San Francisco Traffic Separation Scheme (TSS), shown in pink, was updated June 1, 2013 to reduce whale strikes by ships and improve navigational safety. The four recommended tracks are split between northbound and southbound lanes for vessels >300 tons (blue and purple lines respectfully) and vessels carrying hazardous cargo in bulk such as liquefied gases (pink and orange lines respectfully). The Western States Petroleum Association (WSPA) tankers agreed to transit 50 nm or more offshore (shown in dashed green line).

Introduction

Automatic Identification System (AIS) data from MarineTraffic was harnessed to analyze vessel compliance with the IMO recommended tracks (Figure 1). AIS is an automatic tracking system used on ships and by vessel traffic services to identify and locate vessels in the surrounding area by exchanging electronic data with other ships and AIS base stations. The IMO requires that AIS be fitted aboard all passenger ships, aboard all ships of 300 gross tons, or greater, on international voyages, and aboard all cargo vessels of 500 gross tons, or greater, on non-international voyages (<http://www.imo.org/OurWork/Safety/Navigation/Pages/AIS.aspx>). It was originally developed to improve navigational safety and collision avoidance. However, AIS was also developed for other safety reasons, so using it to determine compliance with the recommended tracks is within the scope of its original intent.

Methods

From June 2 to December 21, 2018, Sanctuary staff set up a MarineTraffic.com subscription to receive email notifications if a tanker or cargo vessel is more than 1.5 nm inshore of the northbound recommended track for vessels 300 gross tons and above (Figure 1). As a MarineTraffic subscriber, MBNMS was able to create a notification area named "IMO Track Alert Zone" with a boundary 1.5 nautical miles inshore of the vessel tracks from Point Sur to Pigeon Point (Figure 2). The southern boundary extended 13.5 nm from Point Sur and the

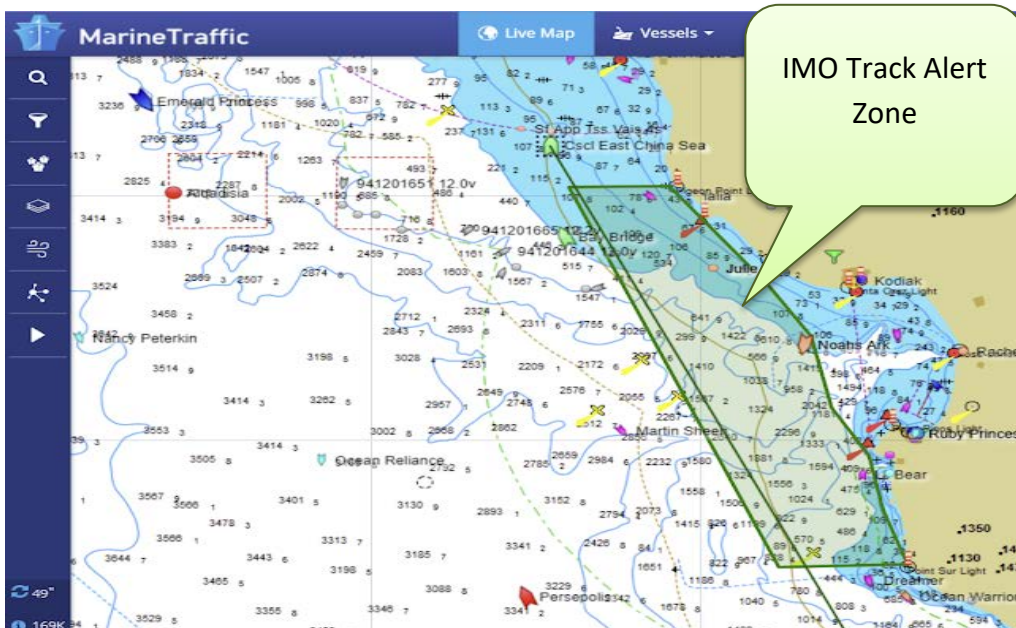


Figure 2. The "IMO Track Alert Zone" is shown in green with dark green boundaries bound to the north by Pigeon Point and to the south by Point Sur. The offshore boundary of the IMO Track Alert Zone is 1.5 nautical miles east of the northbound IMO recommended vessel track for vessels greater than 300 tons not carrying hazardous cargo or crude oil. This example also shows the track (also dark green) of a cargo vessel on 9/26/18.

Northern boundary of the IMO Track Alert Zone extended 11.2 nm from Pigeon Point. MBNMS relied on the emailed notifications from MarineTraffic to alert MBNMS staff if a vessel was traveling more than 1.5 nautical miles inshore from the northbound IMO recommended vessel track and start investigating a potential deviation. Figure 1. International Maritime Organization recommended tracks within Monterey Bay National Marine Sanctuary. The San Francisco Traffic Separation Scheme (TSS), shown in pink, was updated June 1, 2013 to reduce whale strikes by ships and improve navigational safety. The four recommended tracks are split between northbound and southbound lanes for vessels >300 tons (blue and purple lines respectfully) and vessels carrying hazardous cargo in bulk such as liquefied gases (pink and orange lines respectfully). The Western States Petroleum Association (WSPA) tankers agreed to transit 50 nm or more offshore (shown in dashed green line).

If a selected vessel type, either a tanker or cargo vessel, entered the IMO Track Alert Zone, an email notification with the vessel name, latitude and longitude, time, date, vessel speed and heading was sent to the mbnms.permits@noaa.gov. The alert information was verified by reviewing the past track of the vessel in MarineTraffic and if a deviation was observed, the details were logged in a Google spreadsheet that was shared with pertinent sanctuary staff. The Google spreadsheet vessel log details include:

- Date
- Time (UTC)
- Vessel Name
- Repeat offender (number of x's indicate the number of deviations noted since June 2, 2018)
- Link to Google Doc that includes copy of notification and screenshot of vessel track
- Type (Tanker or Cargo and type, e.g. vehicles carrier or Hazard A)
- If the vessel is laden, partially laden or in ballast.
- Country flag
- IMO number
- Maritime Mobile Service Identity (MMSI) number
- Call Sign
- Location of deviation (e.g. cutting corners or traveling east (inshore) of the recommended track)
- Last known port
- Destination Port
- Latitude and longitude from email notification
- Heading from email notification
- Speed (knots) from email notification

- Company or manger
- Insurer
- If USCG letter was sent or calls to Vessel Traffic Services (VTS) were made
- Comments and notes (includes dates of repeat offenses)
- Link to vessel details on MarineTraffic website.

Occasionally data from MarineTraffic was verified using the Central & Northern California Ocean Observing System (CeNCOOS) AIS website or the Southwest Environmental Response Management Application (ERMA). The CeNCOOS AIS data is a courtesy of the Naval Postgraduate School, Department of Oceanography. Sanctuary staff provided *.kml files for the San Francisco TSS and the recommended tracks to CeNCOOS staff to provide spatial references for the AIS data. This CeNCOOS site is checked when any possible deviations are witnessed using MarineTraffic but need to be verified due to a low number of pings (indicated by arrows on the track in MarineTraffic) or if a vessel is 10 nm or less from Point Sur or Pigeon Point. The CeNCOOS site uses a red balloon marker to show the most recent position of the ship and a line extending from that marker to indicate the previous trackline. This trackline is color-coded based on the type of vessel, e.g. tanker tracks are black and cargo tracks are red. The CeNCOOS AIS map updates on every hour and at 20 minutes past each hour, showing the location of ships for the nearshore marine area from Pt. Arena to Pt. Conception as of those times. ERMA receives real time data and also shows tracks for vessels for the last 8 hours but analysis capacity is limited.

MBNMS staff contacts USCG Vessel Traffic Services (VTS) staff in San Francisco if a vessel is observed in real time to be 10 nm or less from Point Sur or Pigeon Point and provided with the details. USCG VTS then determines if there is indeed a deviation using their classified AIS data, and then determines whether to contact the vessel operator to alert them regarding the IMO recommended tracks. As follow-up for repeat deviations, USCG VTS sends a letter to the company that owns the vessel to bring this issue to their attention.

Below is a list of conditions and considerations (caveats) that must be taken into account when analyzing AIS data for possible deviations from IMO ship track recommendations. The IMO Recommended Tracks are non-regulatory guidelines so the tracks are "recommendations only" and not enforceable by US law. The tracks themselves are beyond the 12-mile territorial sea of the United States, where freedom of navigation is observed by the international community as a matter of common law.

Conditions and Considerations (Caveats) for Interpreting Potential IMO Track Non-Compliance Using AIS Data

Design v. Use - AIS was designed for the purpose of ship-to-ship, ship-to-shore, and shore-to-ship communication of information pertinent to navigational safety, search and rescue, security, etc. AIS was not designed for purposes of various ship tracking applications or retrospective ship track analysis.

Signal Interference - AIS radio signals can be interrupted or shortened by atmospheric (RF propagation) - they are not uniform in broadcast strength or range and are not 100% consistent. Receiver arrays also vary in signal detection capability.

Signal Gap - AIS coastal receivers may be absent or non-functional in some areas, causing incomplete data for the region.

AIS Transmission Crash - Individual AIS transmitters may go off-line due to malfunction, power loss, or manual shut-down.

AIS Position Errors - AIS position information may be skewed due to problems with GPS systems or satellites.

Misleading AIS Profiles

Incorrect Operating Status - AIS cargo info is manually entered and is sometimes not updated before leaving port, giving a false status about onboard cargo. Similarly, "destination" and other manual entry profile data may be outdated.

Incorrect Vessel Type - AIS vessel type categories are designed to describe "operational status" (i.e. towing, cargo, fishing, etc.) - not vessel classification (i.e. research, tug, ferry, etc.). When R/V Fulmar deploys a tethered sonar, the boat displays on AIS as "towing" and could be interpreted as a tug and barge, rather than a research vessel. The code 27 could be used as a research vessel classification in AIS, for example, the R/V RACHEL CARSON once appeared on AIS as a "dredge" barge.

False AIS Identity - Military or law enforcement vessels may purposely display false profiles for security reasons.

Shared AIS ID - Some shipping companies have used the same MMSI identifier in the past for multiple ships in a fleet to cut registration costs. For example, sometimes ships are transmitting MMSI of 1193046 which is the default MMSI after AIS installation and means that the MMSI wasn't updated after installation by the vessel operator. The result is that the ship tracks of several vessels appear as that of only one vessel, presenting a confusing and misleading transit pattern.

Data Processing Errors - Computer servers used to log AIS data may go off-line due to power outages or other problems, resulting in incomplete or corrupted data.

Potential Vessel Course Diversion

Traffic Diversion - Vessels may divert from IMO tracks to avoid other traffic or wildlife.

Sea State Diversion - Vessels may divert from IMO tracks to adjust for violent sea state and swell attack angles.

Emergency Diversion - Vessels may divert from IMO tracks due to emergencies, such as steering malfunction, on-board fire, medical evacuation, Coast Guard boarding, etc.

Non-WSPA Tanker - An oil tanker may be operating inshore of the voluntary 50-mile line because it does not belong to a WSPA member organization.

Empty Tanker (in ballast) - An oil tanker may be operating inshore of the voluntary 50-mile stand off line because it is empty (in ballast) and thus carries no oil cargo.

Results

Between June 1, 2018 and December 21, 2018 MBNMS staff received a total of 128 email notifications from MarineTraffic that a large vessel had entered the deviation area. A typical notification example is shown below:

"Vessel X" sailed into 'IMO Track Alert Zone' Area at:

Time: 2018-09-26 11:26 UTC

Position: 36.30823, -122.1616

Speed/Course: 12.8 knots / 329°

Occasionally, a ship would enter the deviation area at Point Sur, then sail northwest out of the deviation area and then back into the IMO Track Alert Zone around Pigeon Point (Figure 3) so

MarineTraffic sent two email notifications. However, only one record (i.e. deviation) was entered into the Google Spreadsheet since the same ship entered the IMO Track Alert Zone twice on the same voyage. A total of 116 deviations were verified and logged into the spreadsheet. Table 1 indicates that the majority of the deviating vessels were cargo vessels. Five (4%) of the 116 deviating vessels were some type of tanker and the 14 vehicles carriers made up 12% of the vessel types deviating (Table 1).



Figure 3. A typical track showing that a vessel entered the deviation area, i.e. IMO Track Alert Zone (light green area in dark green outline), twice and clipped the area both at Point Sur and Pigeon Point. This would prompt MarineTraffic to send two (2) email notifications but only the first email notification details were entered into the spreadsheet. However, both notifications were copied and pasted into each Google Doc linked to the spreadsheet for that deviation. This example is from the track (dark green line) of a vessel on 9/22/18.

Vessel Type	Total
Container Ship: Cargo	41
Container Ship: Cargo - Hazard A (Major)	43
Container Ship: Cargo - Hazard B	2
Container Ship: Cargo - Cargo - Hazard C (Minor)	1
Container Ship: Cargo - Hazard D (Recognizable)	10
Oil/Chemical Tanker-Tanker - Hazard D (Recognizable)	1
Tanker	1
Bulk Carrier	2
Cargo: Self Discharging Bulk Carrier	1
Vehicles Carrier	14
Total	116

Table 1. Vessel Type according to MarineTraffic of deviating vessels between June 1, 2018 and December 21, 2018

Out of the 116 deviations, 55 vessels only deviated once (Table 2) which means that slightly more than half of deviations were due to vessels that deviated more than once. Three individual vessels deviated five times each on non-consecutive days.

Number of vessels	Number of deviations on non-consecutive days per vessel
55	Deviated once
15	Deviated twice
4	Deviated three times
1	Deviated four times
3	Deviated five times

Table 2. Number of deviations on non-consecutive days per vessel.

Most vessels were heading to Oakland (OAK) with the majority heading north from two main ports, either Los Angeles (LAX) or Long Beach (LGB). Only two (2) of the 116 deviating vessels were heading south, all the other vessels were heading north. Most vessels were traveling between 8.3 and 20.3 knots (Figure 4). About 16 vessels were traveling at or below 2.6 knots because they were waiting to enter the San Francisco vessel traffic separation lanes and entered the IMO Track Alert Zone near Pigeon Point. Forty-three (43) of the 116 vessels were traveling at 15 knots or more.

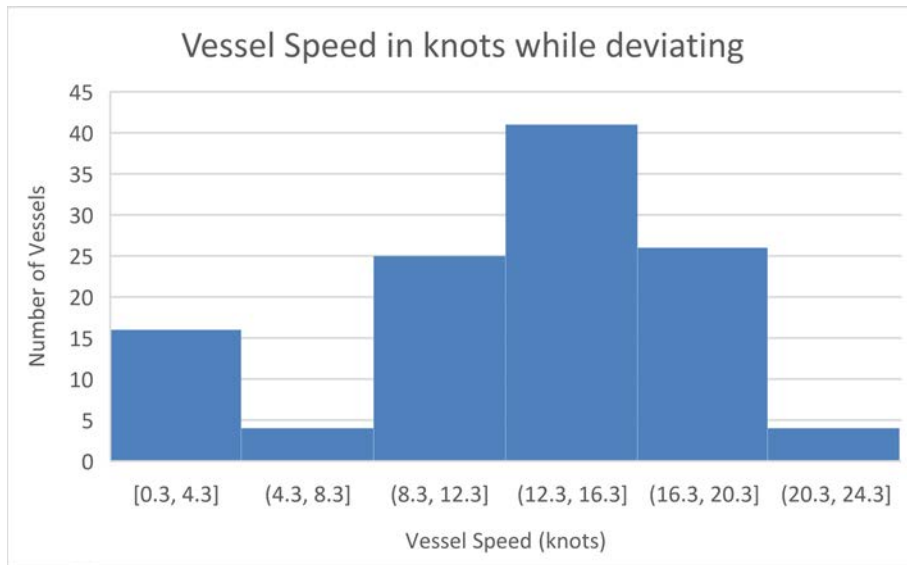


Figure 4. Histogram of vessel speed while deviating.

Every month between 12 and 24 vessels deviated (Table 3) more than 1.5 nm inshore of the northbound IMO vessel track. The highest number of deviations between June 1 and December 21, 2018, occurred during the month of October 2018 (Table 3).

Month	Number of Vessels deviating
Dec (until 12/21/18)	12
Nov	16
Oct	24
Sept	16
Aug	13
July	19
June	16
Total	116

Table 3. Number of deviations per month in 2018.

Egregious deviations occurred at Point Sur (see the cluster of dots offshore of Point Sur in Figure 5) since the majority of the vessels were heading north from ports south of MBNMS. A total of 18 deviations were noted to be egregious: 16 deviations occurred less than 10 nm from Point Sur and 2 additional deviations were caused by vessels heading south and deviating into

the IMO Track Alert Zone.

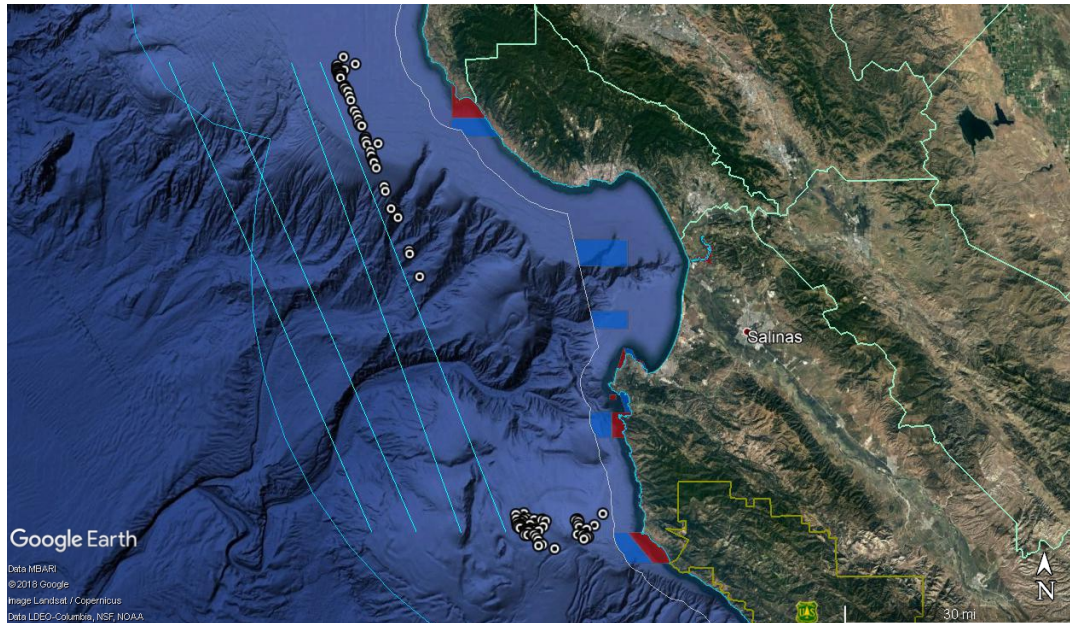


Figure 5. Locations of first received notification alert from MarineTraffic shown as white and black dots. The IMO vessel traffic lines (4 blue lines) and MBNMS boundary are shown in addition to the California State Marine Protected Areas (blue for State Marine Conservation Areas and red for State Marine Reserves).

Discussion

The 2009 to 2012 analysis indicated that most vessels were following the recommended tracks within MBNMS. For example we found that in 2010 approximately 0.25% of all the cargo vessels deviated more than 3 nm inshore of the recommended tracks for vessels 300 gross tons and above. Total annual cargo vessel deviations fluctuated but the total number of individual vessels deviating increased slightly each year and back in 2013, we hypothesized that rising fuel prices, and increased competition could have an impact on industry decisions to stay closer to the coast to decrease transit time between California ports.

In 2018, we used a deviation threshold of 1.5 nm inshore of the northbound recommended track since there are 3 nm between the IMO recommended tracks, thus providing one-half of that as leeway. Because we used a lower threshold for the 2018 analysis, the number of monthly deviations are higher than we found in the 2009 to 2012 analysis. The 2018 analysis highlighted that the same vessels deviate frequently. Available technology allows operators to store and replicate routes, which be one reason for repeat deviations by the same vessel.

Currently we cannot provide the rate of inshore deviations since we do not have the capacity to analyze all 2018 AIS data to determine the number of vessels transiting the Sanctuary. However, MarineTraffic does provide density maps for previous years, 2016 and 2017 which allows for a qualitative comparison considering that only 6 months of AIS traffic were reviewed

in 2018. Figure 6 and Figure 7 show that the majority of Cargo and Container ships did use the IMO recommended tracks but that both in 2016 and 2017, similar deviations occurred as in 2018 and there were also several vessels that transited within 10 nm of Point Sur.

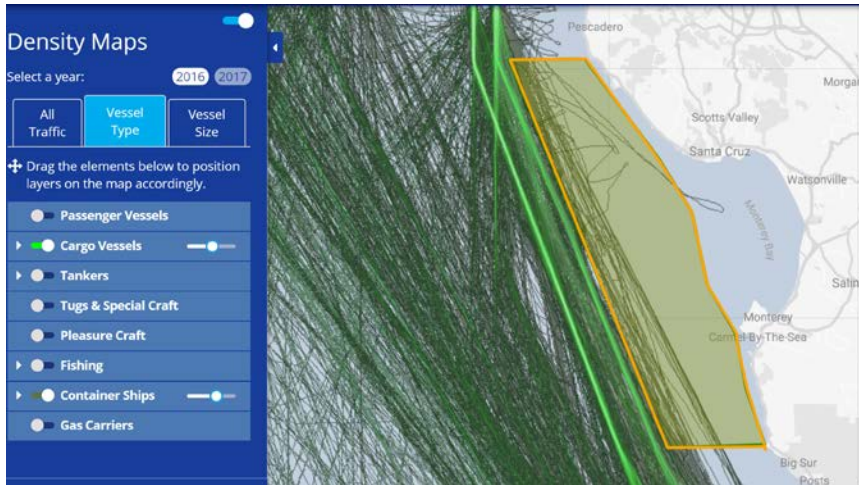


Figure 6. MarineTraffic density map for Cargo Vessels and Container Ships transiting west of Monterey Bay in 2016. The legend is not available because both the Cargo Vessels and Container Ships are shown (MarineTraffic has limited GIS capacity) but the density is provided in routes/0.09km²/year and the lighter green colors represent higher densities. The IMO Track Alert Zone is shown in orange.

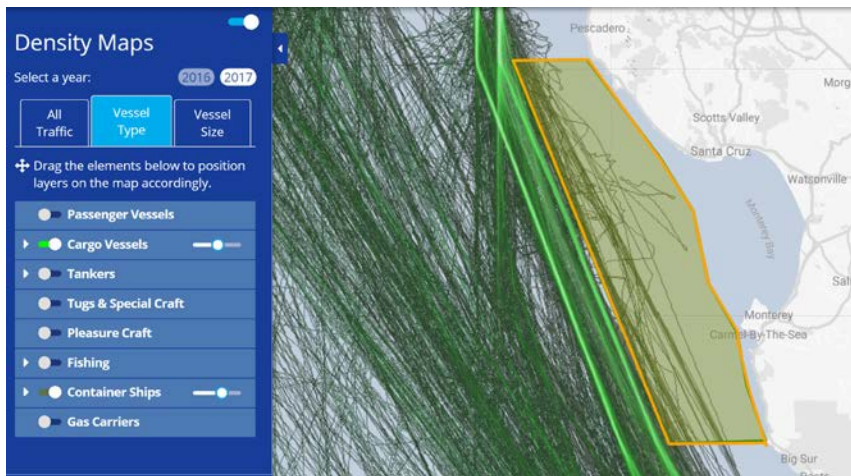


Figure 7. MarineTraffic density map for Cargo Vessels and Container Ships transiting west of Monterey Bay in 2017. The legend is not available (MarineTraffic has limited GIS capacity) but the density is provided in routes/0.09km²/year and the lighter green colors represent higher densities. The IMO Track Alert Zone is shown in orange.

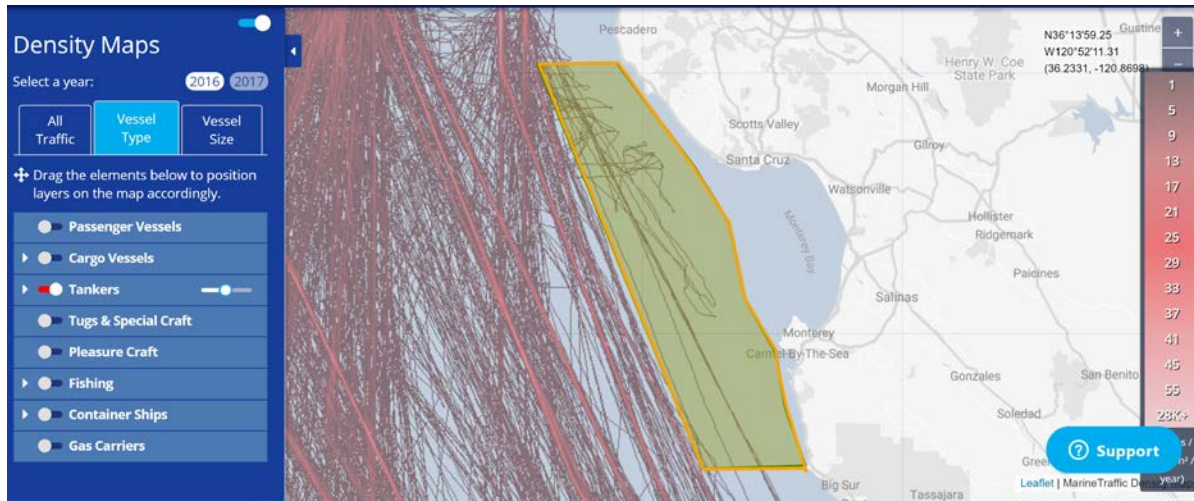


Figure 8. MarineTraffic density map for Tankers transiting west of Monterey Bay in 2016. Density is provided in routes/0.09km²/year and the lighter red colors represent higher densities. The IMO Track Alert Zone is shown in orange.

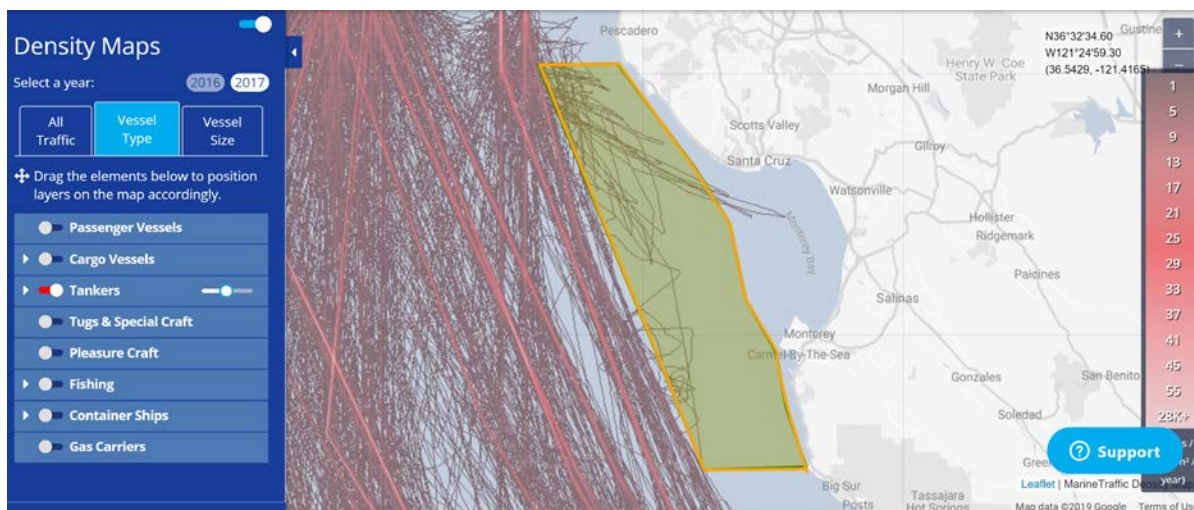


Figure 9. MarineTraffic density map for Tankers transiting west of Monterey Bay in 2017. Density is provided in routes/0.09km²/year and the lighter red colors represent higher densities. The IMO Track Alert Zone is shown in orange.

Figure 8 and Figure 9 indicate that both in 2016 and 2017, tankers tended to primarily deviate in the northern area of the IMO Track Alert Zone. This could be due to vessels having to wait until they can enter the San Francisco Traffic Separation Zone. Both of the 2016 and 2017 density maps for Tankers do seem to indicate that considerably more tankers deviated in those years since the 2018 analysis showed that only one tanker deviated into the IMO Track Alert Zone between June 1, 2018 and December 21, 2018. In the future, if possible, complete years will be analyzed and when the 2018 density map becomes available on Marine Traffic, it will be compared to the 2016 and 2017 density data and the individual reviews.

Resource Protection Coordinators from Channel Islands National Marine Sanctuary and Cordell Bank National Marine Sanctuary have led the effort to reduce whale ship strikes. The voluntary vessel speed reduction (VSR) to 10 knots program continued in 2018 with broadcast of Local Notice to Mariners via USCG and direct communications with ship captains from the Vessel Traffic Service in San Francisco and the Marine Exchange in Long Beach. MBNMS would like to analyze how this incentive-based VSR effort effects speeds of large vessels within MBNMS when the ships are not within the San Francisco Area VSR but it will require higher resolution analysis of several levels of data that would be time-consuming to culminate.

Based on recommendations following the 2013 analysis, MBNMS worked with the National Data Buoy Center (NDBC) to relocate buoy 46042. The buoy was only 0.57 nautical miles west of the northbound IMO recommended track for vessels 300 gross tons and above (Figure 10). The close proximity of this buoy to the recommended track had been used as a reason for transiting east of the northbound track and thus triggering a deviation review and contact by the USCG. However, even though now the buoy is located 3.5 nm east of its original location, and well east of the northbound recommended track (Figure 11), vessels are still deviating inshore of the northbound IMO recommended lane.

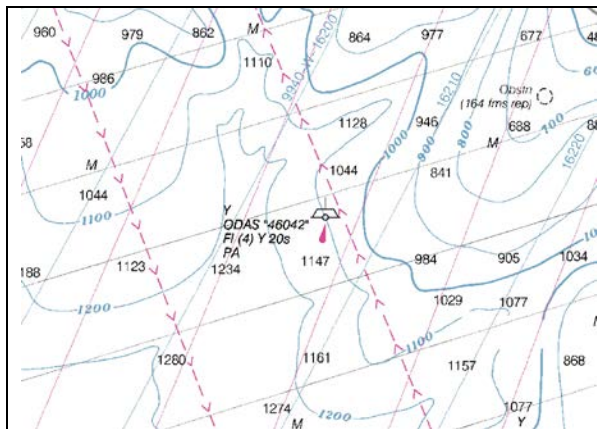


Figure 10. Section of NOAA Raster Navigational Chart (RNC) showing National Data Buoy Center (NDBC) buoy 46042 in 2013 located west of the northbound IMO recommended track for vessels 300 gross tons and above (pink line with arrows pointing up)

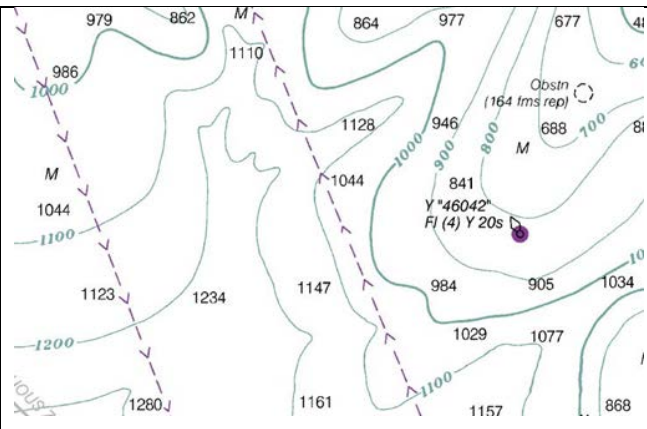


Figure 11. Section of NOAA Raster Navigational Chart (RNC) showing National Data Buoy Center (NDBC) buoy 46042 after relocation on 8/16/17 located approximately 3 nm east of northbound IMO recommended track for vessels 300 gross tons and above (pink line with arrows pointing up)

In the previous analysis, both the NMFS and the NPS analyses indicate that cargo vessels tend to cut inshore at the north end of the northbound recommended track for vessels 300 gross tons and above to enter the San Francisco TSS thus bringing them closer to Pigeon Point as well as other environmentally sensitive areas such as the area around Año Nuevo. We

hypothesized that since the southern San Francisco TSS lane was lengthened June 1, 2013, this corner cutting might be reduced in the future. However, that has not been the case based on the 2018 review.

Daily reviews are not time intensive but can have a significant impact on compliance through our collaboration with the USCG. When letters are sent by the USCG, the vessel owners and operators can be reminded that the recommended tracks were implemented not just for environmental safety in a national marine sanctuary but also for the vessel's safety in real time. MBNMS staff also learn more about the reasons why ships deviate (see AIS caveats - Potential Vessel Course Diversion) and can address issues, such as research equipment deployed within the IMO recommended tracks.

Next Steps

Conduct Outreach

Outreach is always at the center of successful MBNMS resource protection strategies. As a priority, staff will be communicating with the shipping industry in order to discuss and present these findings and find additional ways to collaborate. In addition, we plan to make the final report available to the public through a variety of ways, some of which are described below:

- Disseminate the final report via website, presentations and listservs.
- Continue to review and ensure that the USCG Coast Pilot is up-to-date on MBNMS and recommended track information.
- Contact the Industry to present findings and encourage continued use of recommended tracks.
- If necessary, use "Local notice to mariners" for district 11 as appropriate to let mariners know of any changes with the recommended lanes.
- Keep Sanctuary vessel traffic website up-to-date (<http://montereybay.noaa.gov/resourcepro/resmanissues/vessels.html>).
- Present information at pertinent conferences and meetings, including the MBNMS Sanctuary Advisory Council.

Explore accessing government AIS data

Bureau of Ocean Energy Management (BOEM) and NOAA have worked together to build a collection of tools and instructional material to help analysts process AIS data and derive products to understand marine transportation patterns. At the time of publication, AIS data from 2009 to 2017 were available. The tool they provide is called the AIS data handler and can be found on the website <http://marinecadastre.gov/AIS/default.aspx>. Sanctuary staff will continue to troubleshoot the Coastal Services Center's AIS data handler, a GIS extension, so that we can analyze AIS data in-house.

MBNMS staff have signed up as a pilot user of UNCLASSIFIED S2A (Sealink Advanced Analysis) and taken both the introduction and advanced training. S2A is a joint Navy-CG system which National Maritime Intelligence-integration Office (NMIO) is pushing as a system for the whole of government. It is not new technology as it has existed at the top secret level for about 9 years. This system could potentially eventually replace the need for purchasing MarineTraffic.

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References

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De Beukelaer, S., Miller, C., Moore, T.J., Kathey, S., and Grimmer K., 2014. Monterey Bay National Marine Sanctuary Vessel Traffic Analysis 2009-2012. Monterey Bay National Marine Sanctuary Technical Report, 44 pp.

Appendix A

United States Coast Guard letter template

The purpose of this letter is to advise you the US Coast Guard has received a report that on XX/XX/XXXX, the vessel X was transiting shoreward of the Recommended Tracks through Monterey Bay National Marine Sanctuary established by the International Maritime Organization (IMO) on December 1, 2000. Using AIS data, Monterey Bay National Marine Sanctuary officials observed the vessel transiting approximately X nautical miles off shore from Monterey, California. The observed position of the vessel was approximately X nautical miles shoreward of the IMO recommended track for large commercial vessels transiting through the sanctuary.

The recommended tracks were established to enhance the safety of navigation by increasing order and predictability for offshore traffic patterns. They also increase protection for the resources of Monterey Bay National Marine Sanctuary. The sanctuary is home to an extraordinarily diverse array of marine mammals, sea birds, fishes and invertebrates, including many species that are particularly sensitive to the impacts of spilled oil or other hazardous materials.

I have enclosed a chart that depicts these recommended tracks. Although they are not mandatory, vessels are encouraged to comply with these recommendations that have been sanctioned by IMO. Please contact X at (XXX)XXX-XXXX if you have any questions concerning this letter.