

Vessel Transits through Olympic Coast National Marine Sanctuary and Area to be Avoided – 2020 Estimated Compliance

Introduction

Designated in 1994, Olympic Coast National Marine Sanctuary (OCNMS) is a place of regional, national, and global significance. OCNMS is connected to both the Juan de Fuca Eddy Ecosystem and the California Current Large Marine Ecosystem, and is the site of one of North

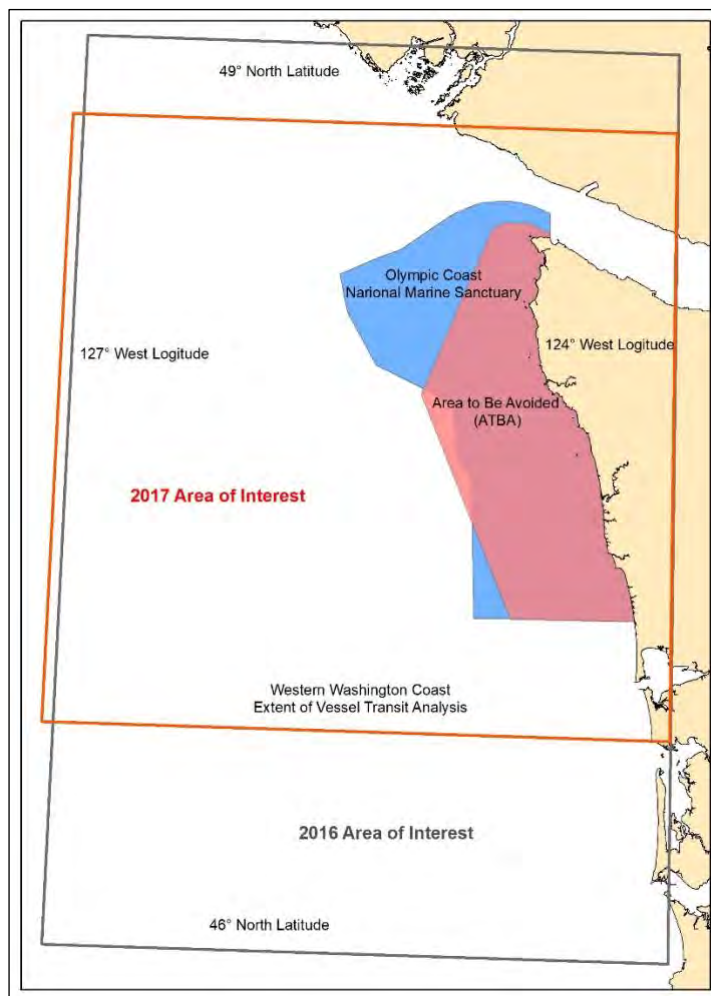


Figure 1: Vessel Transit Analysis Area. Olympic Coast National Marine Sanctuary is shaded in blue and the Area to be Avoided is shaded in red. The larger area of interest from 2012 through 2016 is outlined in gray; the smaller area of interest from 2017-2020 is outlined in red. Credit: NOAA.

America's most productive marine regions and is bounded landward by spectacular, undeveloped shorelines. Potential releases of oil or other hazardous material from a major marine accident, in combination with climate change and ocean acidification, pose serious threats to the health and quality of sanctuary resources. Prevention of spills is therefore one of OCNMS's highest priorities. As a steward of these vitally important natural resources, OCNMS will continue to collaborate with other governments, agencies, and user groups to reduce the potential for oil spills and improve contingency planning for spill response. OCNMS's major oil spill prevention initiative is an International Maritime Organization (IMO) designated Area to be Avoided (ATBA). This report is the sanctuary's annual reporting of estimated ATBA compliance rates. Data from Automatic Identification System (AIS) transceivers is collected, vessel details are added, and compliance to the ATBA is evaluated.

Our evaluation of the 2020 vessel transits off the Washington coast shows a compliance rate consistent with the previous 3 years: 95.9% in 2017, 95.0% in 2018, 95.5% in 2019, and 94.9% in 2020.

Background

During the sanctuary designation process, NOAA worked with the U.S. delegation to the IMO to designate an Area to be Avoided (ATBA) off the coast of Washington to reduce the risk of marine casualties including oil spills and potential environmental damage to Olympic Coast National Marine Sanctuary. For more information on the ATBA see the attached informational flyer (Figure 3 and Figure 4). This flyer is used in outreach efforts to the marine industry, and is also included in the U.S. Coast Guard Sector Puget Sound Vessel Traffic Service's (VTS) User's Manual. In addition, ATBA boundaries and provisions are included in official navigational products, such as nautical charts and Coast Pilot 10.

ATBA Provisions

All ships and barges that carry oil or hazardous materials as cargo, and all ships 400 gross tons and above, solely in transit, are advised to transit outside of this ATBA. OCNMS, in cooperation with the U.S. and Canadian coast guards, monitors vessel compliance under this voluntary program. While the ATBA does not apply to government vessels, the sanctuary, in partnership with the U.S. and Canadian coast guards, seeks to ensure that government vessels comply when in transit. This includes NOAA, U.S. and Canadian Coast Guard vessels, and the U.S. Navy.

It is important to understand the implications of the ATBA provision "solely in transit." The ATBA was not intended to preclude lawful operations of vessels within the ATBA. Examples include fishing, search and rescue, and research vessels that may conduct operations off Washington's outer coast. When these vessels are moving through the area en route to working grounds beyond the ATBA, or solely in transit, we request their compliance with the ATBA.

While we recognize that there are vessels over 400 gross tons that are legitimately conducting operations in the ATBA, we do not attempt to adjust the estimated compliance numbers to account for this. For that reason some vessel types, such as fishing and research vessels, will likely show an artificially lower compliance rate because all of their occurrences in the ATBA are counted as non-compliance. The reason for this approach is the difficulty of determining the nature of some transits. In some cases, it is fairly obvious from the vessel track line that a research or fishing vessel is conducting operations, in other cases it is not as obvious. Due to this difficulty, and in order to be consistent from one year to the next, OCNMS does not make adjustments to the compliance estimates for individual vessel transits based on perceived operations.

ATBA Compliance Reporting

From 2004 through 2011, the Washington State Department of Ecology (Ecology) published estimated ATBA compliance rates as part of their annual Vessel Entries and Transits (VEAT) publication. VEAT is offered by Ecology in response to public requests for information about commercial vessel traffic in Washington waters. There is considerable overlap between the VEAT report and OCNMS' vessel monitoring efforts and the reason why the two reports were once coordinated. When OCNMS made significant changes to their monitoring methods, additional documentation was needed. This led to the need, starting in 2012, for an independent OCNMS report. Both the VEAT (2004-2011) and OCNMS (2012-2020) reports can be downloaded at [the Vessel Traffic Monitoring site](#).

Discussion of Data

In 2017, in response to a loss of OCNMS technical capacity and the need to make our vessel traffic monitoring more sustainable, a number of changes were instituted. These three changes were: the source of Automatic Identification System (AIS) data, the source of third party vessel attributes, and the area analyzed. The first two changes were made to become more consistent with the NOAA Fisheries Office of Protected Resources (OPR), which has well-established AIS processing techniques currently in use for a variety of conservation applications involving vessel traffic. By collaborating with OPR, OCNMS is able to maintain vessel monitoring at a reduced staffing level. The 2020 data was processed in the same manner as 2017 through 2019, allowing comparison between those years. There is additional detail on our new methodology and data sources in the [2017 report](#).

The AIS system is primarily a collision avoidance system and does not have all of the information needed for monitoring vessel traffic and estimating ATBA compliance in the sanctuary, e.g., descriptive vessel types and gross tonnage. This information is obtained from the IHS Maritime and Trade's (IHS) World Register of Ships. Relevant IHS vessel attributes are joined to the AIS transit data using the vessel's Maritime Mobile Service Identity (MMSI) number as a common key. The 320 different possible vessel types found in the IHS dataset were aggregated into vessel type classes consistent with previous vessel type descriptions. To simplify analysis and visual display of data, similar vessel types are grouped into one of six more general vessel classes (see Vessel Classes column in Table 1).

For the analysis of AIS data between 2012 and 2016, we reviewed transits from 46° to 49° north latitude and from 124° to 127° west longitude. This 29,099 square mile area covered the entire outer coast of Washington state (see Figure 1) and was selected to support the [marine spatial planning](#) efforts of the state of Washington. Starting in 2017, a smaller 19,692 square mile area was selected. The new area is from approximately 46°45' N to 48°45' N and maintains the same east and west boundaries (see Figure 1). This change reduces the number of vessels that needed to be researched.

Table 1: Changes to Vessel Types from 2011-2020

| 2011 Vessel Types | 2012-2013 Vessel Types | 2014-2020¹ Vessel Types | Vessel Classes |
|--------------------------------------|-------------------------------|---|-----------------------|
| Bulk Carrier | Bulk Carrier | Bulk Carrier | CARGO |
| Ore-Bulk-Oil Vessel (OBO) | Bulk Carrier | Bulk Carrier | CARGO |
| Cable Layer | Cable Layer | Cable Layer | MISC |
| General Cargo Ship | Cargo Ship | Cargo Ship | CARGO |
| Heavy Load Carrier | Cargo Ship | Cargo Ship | CARGO |
| Non-oil Tanker | Chemical Carrier | Chemical Carrier | CARGO |
| Chemical Tanker | Chemical Carrier | Chemical Carrier | TANKER |
| Container Ship | Container Ship | Container Ship | CARGO |
| | Dredger | Dredger | MISC |
| | Drill Ship | Drill Ship | MISC |
| Fishing Vessel | Fishing Vessel | Fishing Vessel | FISHING |
| (LPG) and (LNG) Carrier ² | Liquefied Gas Carrier | Liquefied Gas Carrier | TANKER |
| Oil Tanker | Oil Tanker | Oil Tanker | TANKER |
| Cruise Ship | Passenger Ship | Passenger Ship | PASSENGER |
| | Pollution Control | Pollution Control | MISC |
| | Private Vessel | Private Vessel | MISC |
| | Public Vessels ³ | Public Vessels | MISC |
| Refrigerated Ship | Refrigerated Cargo | Refrigerated Cargo | CARGO |
| | Research Ship | Research Ship | MISC |
| Roll-on Roll-off Vessel (RoRo) | RoRo Cargo Ship | RoRo Cargo Ship | CARGO |
| | Supply Ship | Supply Ship | MISC |
| Tug ⁴ | Tug | Tug | TUG |
| Articulated Tank Barge (ATB) | Tug | Articulated Tug Barge ⁵ | TUG |
| Tugs with Chemical Barge | Tug | Tug | TUG |
| Tugs with Oil Barge | Tug | Tug | TUG |
| Vehicle Carrier | Vehicle Carrier | Vehicle Carrier | CARGO |

¹ Due to changes in data sources and methods, some vessels had their type changed in 2017. Care should be taken in comparing results from 2017-2020 and later years to data from the 2014-2016 period.

² Liquefied Petroleum Gas (LPG) and Liquefied Natural Gas (LNG) are types of Liquefied Gas Carriers.

³ The ATBA does not apply to public vessels and they are not included in the estimated compliance table. OCNMS collects this information and it may be used for different types of analysis.

⁴ Only tugs that were transiting with cargoes of petroleum or hazardous materials were tracked prior to 2012.

⁵ From 2012-2013, Articulated Tug Barge (ATB) vessels were included in the vessel type Tug; starting in 2014, ATB vessels were broken out into their own category.

By processing of AIS data, adding unique transit codes, adding third party vessel attributes, and analyzing transits by area (e.g., OCNMS and ATBA), we determine estimated compliance to the OCNMS ATBA. This estimated compliance is broken out by vessel type in Table 2. The overall estimated compliance for the OCNMS ATBA in 2020 is 94.9%. These results are further discussed in the following section.

Table 2: Estimated ATBA Compliance Rates for 2020 (vessels > 400 GT)

| Vessel Type | Area of Interest⁶ | Transits passing through the sanctuary⁷ | Transits passing through the ATBA within the sanctuary⁸ | Estimated ATBA Compliance Rate⁹ |
|-----------------------|-------------------------------------|---|---|---|
| | 1 | 2 | 3 | 4 |
| Articulated Tug Barge | 292 | 275 | 15 | 94.5% |
| Bulk Carrier | 3802 | 1940 | 48 | 97.5% |
| Cable Layer | 74 | 46 | 5 | 89.1% |
| Cargo Ship | 538 | 322 | 13 | 96.0% |
| Chemical Carrier | 740 | 531 | 13 | 97.6% |
| Container Ship | 2031 | 1230 | 22 | 98.2% |
| Dredger | 10 | 5 | 0 | 100.0% |
| Fishing Vessel | 404 | 212 | 74 | 65.1% |
| Liquefied Gas Carrier | 48 | 24 | 0 | 100.0% |
| Oil Tanker | 306 | 207 | 0 | 100.0% |
| Passenger Ship | 4 | 4 | 1 | 75.0% |
| Private Vessel | 38 | 26 | 11 | 57.7% |
| Refrigerated Cargo | 27 | 17 | 0 | 100.0% |
| Research Ship | 134 | 54 | 24 | 55.6% |
| RoRo Cargo Ship | 171 | 104 | 1 | 99.0% |
| Supply Ship | 68 | 31 | 5 | 83.9% |
| Tug | 662 | 255 | 46 | 82.0% |
| Vehicle Carriers | 558 | 431 | 11 | 97.4% |
| TOTAL | 9907 | 5714 | 289 | 94.9% |

⁶ The vessel transits in Column 1 are from AIS data and include commercial vessels greater than 400 gross tons. This is a smaller geographic area than was reported 2012 - 2016.

⁷ Column 2 includes a subset of the S-AIS vessel transits through the sanctuary.

⁸ Column 3 includes a subset of the sanctuary vessel transits that had at least one AIS record within the ATBA. These are vessels potentially not complying with the provisions of the ATBA.

⁹ Column 4 shows the percentage of vessels transiting through the sanctuary that stayed out of the ATBA. {Column 4 = 1 - (Column3/Column2)}. This is used as an estimate of compliance with ATBA provisions.

Data Analysis

Because of changes in methodology in 2017, several additional steps were taken to evaluate the 2017 findings. This analysis is more fully described in the 2017 report. The 2020 data methodology is the same as 2017 through 2019. We continue our analysis by gross tonnage categories, which started in 2017. This way of looking at compliance allows comparisons from before and after the 2017 changes.

A critical factor in estimating OCNMS ATBA compliance is the vessel’s gross tonnage. Gross tonnage is not one of the vessel attributes that is included in the AIS data stream, and it must be added in post processing. Gross tonnage, a more objective vessel characteristic than vessel type, should be less sensitive to changes in vessel data source. We reviewed our 2020 data using this additional format, see **Error! Reference source not found..**

Table 3: 2020 estimated compliance, by gross tonnage.

| Gross Tonnage (GT) | Transits passing through the sanctuary | Transits passing through the ATBA within the sanctuary | Estimated ATBA Compliance Rate |
|----------------------|--|--|--------------------------------|
| 400 to 9,999 GT | 953 | 183 | 80.8% |
| 10,000 to 19,999 GT | 280 | 16 | 94.3% |
| 20,000 to 29,999 GT | 998 | 19 | 98.1% |
| 30,000 GT or greater | 3483 | 71 | 98.0% |
| TOTAL | 5714 | 289 | 94.9% |



Figure 2 illustrates vessel compliance trends over the last four years. Three of the four categories show slight, but consistent, drops in compliance. The smallest category (400-9,999 GT) shows the most variability, without a consistent trend. The 20,000-29,999 GT and 30,000 GT and

greater categories, representing large commercial vessels, showed negligible changes in compliance.



Figure 2: Trends in estimated ATBA Compliance (2017-2020). Credit: NOAA.

Summary

The estimated compliance of the ATBA for 2020 continues to reflect a high degree of cooperation by the maritime industry. Overall estimates of ATBA compliance rates have been consistent over the last 4 years, e.g., 95.9% in 2017, 95.0% in 2018, 95.5% in 2019, and 94.9% in 2020.

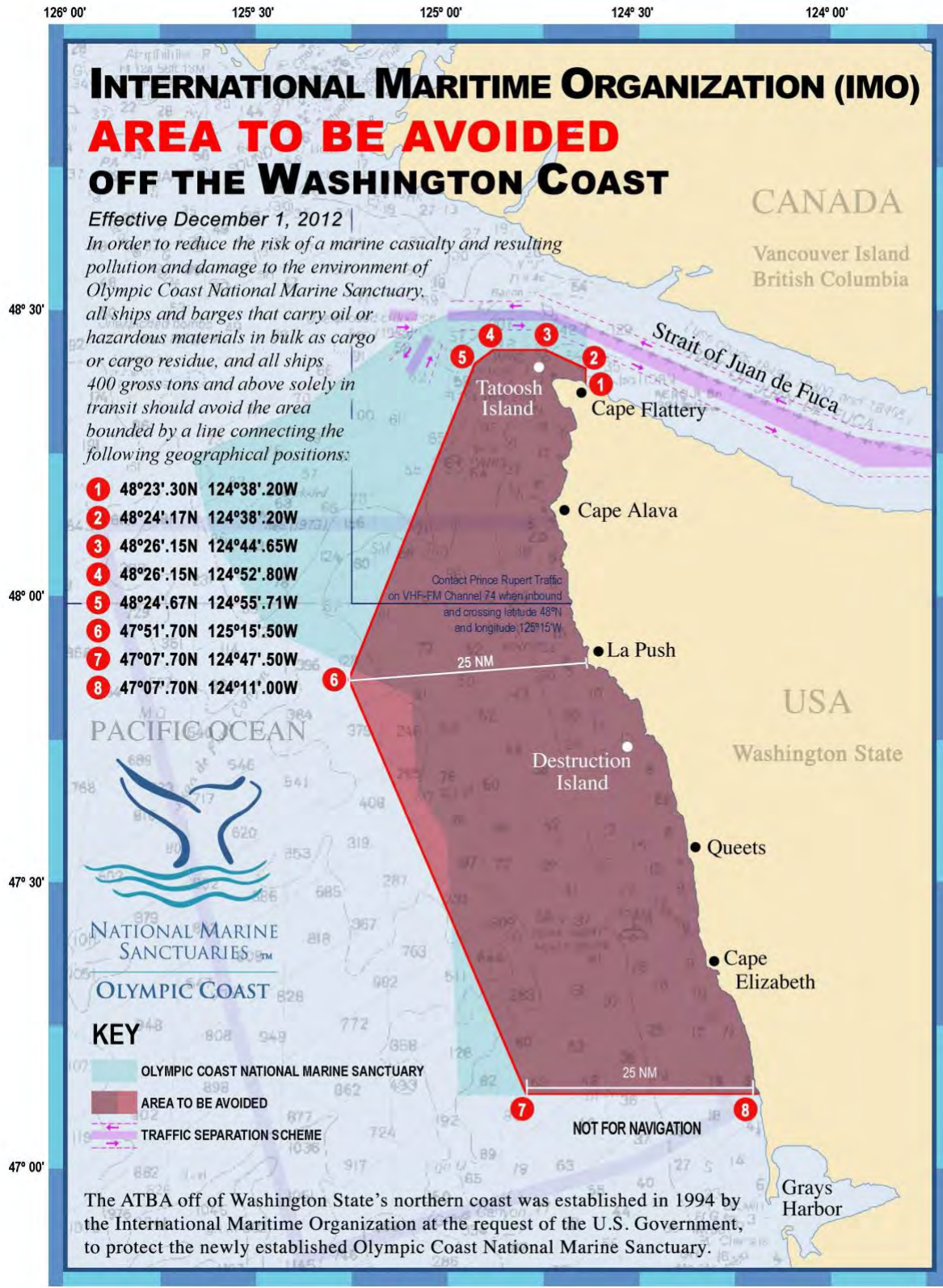


Figure 3: ATBA Information Flyer – Page 1; shows boundary and explains to which vessels it applies. Credit: NOAA.

Why does the IMO establish ATBAs?

- The IMO establishes ATBAs in defined areas where navigation is very hazardous or where it is important to avoid casualties.

Why is it important for vessels to remain offshore and avoid this area?

- Reduces risk of vessel grounding on shore
- Reduces risk of collision with small vessels traveling close to shore
- Allows more time for assistance to arrive to help a disabled vessel
- Increases protection of coastal resources
- In the event of an oil spill:
 - Allows more time for spill cleanup and containment crews to arrive
 - Decreases the chance of spill impacts on the shoreline
 - Increases spill evaporation and degradation time

How were the boundaries of the ATBA chosen?

- The boundaries were chosen to protect sanctuary resources most at risk from vessel casualties.
- The boundaries are compatible with the Traffic Separation Scheme

How was the vessel applicability chosen for the ATBA?

- Vessels greater than 400 gross tons were selected because of the substantial amount of bunker fuel that they carry and the risk that a spill would pose to sanctuary resources
- Vessels that carry oil or hazardous materials in bulk as cargo or cargo residue were selected due to the risk that a spill would pose to sanctuary resources
- The ATBA applies to vessels solely in transit and does not apply to vessels engaged in activities otherwise allowed in the sanctuary, such as fishing and research. The ATBA also does not apply to government vessels, although they are encouraged to avoid the area when solely in transit.

Natural characteristics of Olympic Coast National Marine Sanctuary:



- 128 species of seabirds within the sanctuary
- 29 species of whales, dolphins, and other marine mammals reside or visit the area
- Washington State's only sea otter population
- Many species of fish and shellfish harvested for commercial, subsistence or recreational purposes
- Over 300 species of resident intertidal invertebrates, aquatic plants, and fish
- Diverse habitat types supporting complex food chains, including kelp communities, rocky intertidal zones, sand beaches, and offshore rocks
- Within the usual and accustomed fishing grounds of the Hoh, Makah, Quileute tribes and the Quinault Indian Nation
- Adjacent to Olympic National Park, Washington Islands National Wildlife Refuges, and Washington State Seashore Conservation Area

FOR MORE VESSEL TRAFFIC INFORMATION:

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<http://olympiccoast.noaa.gov/protect/incidentresponse/atba.html>



8/26/2015

Figure 4: ATBA Information Flyer – Page 2; provides rationale for ATBA and information on OCNMS. Credit: NOAA.