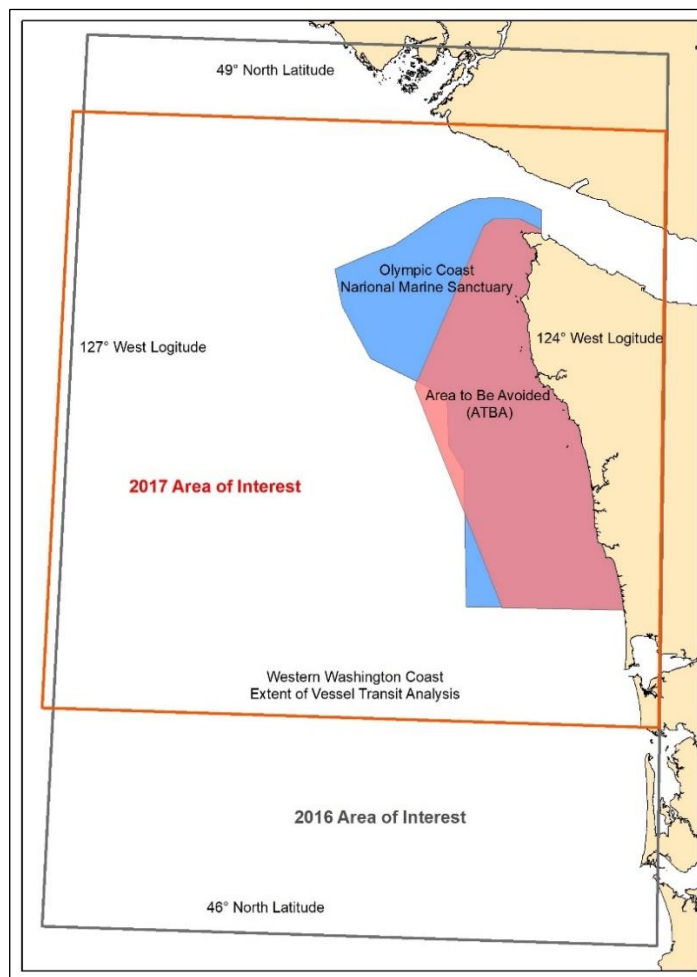




## Vessel Transits through Olympic Coast National Marine Sanctuary and Area to be Avoided – 2023 Estimated Cooperation

### 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 America's most productive marine regions and is bounded landward by spectacular, undeveloped shorelines of the Washington coast. 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 resources within the sanctuary. Prevention of spills is therefore one of OCNMS's highest priorities. As a steward of these vitally important natural and cultural resources, OCNMS will continue to collaborate with other governments (including tribes), 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 cooperation rates. Data from Automatic Identification System (AIS) transceivers is collected, vessel details are added, and cooperation with the ATBA is evaluated.



**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 2017-2023 is outlined in red. Credit: NOAA.

Our evaluation of the 2023 vessel transits off the Washington coast shows a 90.5% cooperation rate, similar to that in 2021 (89.7%) and 2022 (89.6%). However, this is a significant drop in cooperation compared to recent years with a relatively consistent rate between 2017 and 2020 of around 95% cooperation.

## Background

During sanctuary designation, NOAA worked with the U.S. delegation to the IMO to designate an ATBA off Washington to reduce the risk of marine casualties, including oil spills, and potential environmental damage to OCNMS (Figure 1). For more information on the ATBA visit [our website](#). A 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 cooperation 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 cooperation 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 cooperation numbers to account for this. For that reason, some vessel types, such as fishing and research vessels, will likely show an artificially lower cooperation rate because all of their occurrences in the ATBA are counted as non-cooperation. 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 cooperation estimates for individual vessel transits based on perceived operations.

## ATBA Cooperation Reporting

From 2004 through 2011, the Washington State Department of Ecology (Ecology) published estimated ATBA cooperation 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 monitoring methods, additional documentation was needed. This led to the need for an independent OCNMS report. Both the VEAT (2004-2011) and OCNMS (2012-2023) 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 2023 data were processed similarly to 2017 – 2022, 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 cooperation 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 (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 Washington state. 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. This change reduces the number of vessels that needed to be researched.

**Table 1:** Changes to Vessel Types from 2011-2022

| <b>2011 Vessel Types</b>             | <b>2012-2013 Vessel Types</b> | <b>2014-2023<sup>1</sup> Vessel Types</b> | <b>Vessel Classes</b> |
|--------------------------------------|-------------------------------|---|-----------------------|
| 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                 |
| N/A <sup>2</sup>                     | Dredger                       | Dredger                                   | Misc                  |
| N/A                                  | Drill Ship                    | Drill Ship                                | Misc                  |
| Fishing Vessel                       | Fishing Vessel                | Fishing Vessel                            | Fishing               |
| (LPG) and (LNG) Carrier <sup>3</sup> | Liquefied Gas Carrier         | Liquefied Gas Carrier                     | Tanker                |
| Oil Tanker                           | Oil Tanker                    | Oil Tanker                                | Tanker                |
| Cruise Ship                          | Passenger Ship                | Passenger Ship                            | Passenger             |
| N/A                                  | Pollution Control             | Pollution Control                         | Misc                  |
| N/A                                  | Private Vessel                | Private Vessel                            | Misc                  |
| N/A                                  | Public Vessels <sup>4</sup>   | Public Vessels                            | Misc                  |
| Refrigerated Ship                    | Refrigerated Cargo            | Refrigerated Cargo                        | Cargo                 |
| N/A                                  | Research Ship                 | Research Ship                             | Misc                  |
| Roll-on Roll-off Vessel (RoRo)       | RoRo Cargo Ship               | RoRo Cargo Ship                           | Cargo                 |
| N/A                                  | Supply Ship                   | Supply Ship                               | Misc                  |
| Tug <sup>5</sup>                     | Tug                           | Tug                                       | Tug                   |
| Articulated Tank Barge (ATB)         | Tug                           | Articulated Tug Barge <sup>6</sup>        | Tug                   |
| Tugs with Chemical Barge             | Tug                           | Tug                                       | Tug                   |
| Tugs with Oil Barge                  | Tug                           | Tug                                       | Tug                   |
| Vehicle Carrier                      | Vehicle Carrier               | Vehicle Carrier                           | Cargo                 |

<sup>1</sup> Due to changes in data sources and methods, some vessels had their type changed in 2017. Care should be taken in comparing results from 2017-2023 and later years to data from the 2014-2016 period.

<sup>2</sup> No vessel category existed for this row in 2011.

<sup>3</sup> Liquefied Petroleum Gas (LPG) and Liquefied Natural Gas (LNG) are types of Liquefied Gas Carriers.

<sup>4</sup> 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.

<sup>5</sup> Only tugs that were transiting with cargoes of petroleum or hazardous materials were tracked prior to 2012.

<sup>6</sup> 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 AIS data, adding unique transit codes and third-party vessel attributes, and analyzing transits by area (e.g., OCNMS and ATBA), we determine estimated cooperation to the OCNMS ATBA. This estimated cooperation is broken out by vessel type in Table 2. The overall estimated cooperation for the OCNMS ATBA in 2023 is 90.5%. These results are further discussed in the following section.

**Table 2:** Estimated ATBA Cooperation Rates for 2023 (vessels > 400 GT)

| <b>Vessel Type</b>      | <b>Area of Interest<sup>7</sup></b> | <b>Transits passing through the sanctuary<sup>8</sup></b> | <b>Transits passing through the ATBA within the sanctuary<sup>9</sup></b> | <b>Estimated ATBA Cooperation Rate<sup>10</sup></b> |
|-------------------------|-------------------------------------|---|---|---|
| <b>Column number</b>    | <b>1</b>                            | <b>2</b>  | <b>3</b>  | <b>4</b>  |
| Articulated Tug Barge   | 446                                 | 383   | 70  | 81.7%   |
| Bulk Carrier            | 3934                                | 1903  | 91  | 95.2%   |
| Cable Layer             | 15                                  | 8   | 2   | 75%   |
| Cargo Ship              | 556                                 | 325   | 29  | 91.1%   |
| Chemical Carrier        | 740                                 | 566   | 26  | 95.4%   |
| Container Ship          | 1869                                | 1160  | 61  | 94.7%   |
| Dredger                 | 11                                  | 1   | 0   | 100%  |
| Fishing Vessel          | 776                                 | 271   | 83  | 69.4%   |
| Liquified Gas Carrier   | 63                                  | 30  | 2   | 93.3%   |
| Oil Tanker              | 430                                 | 294   | 7   | 97.6%   |
| Passenger Ship          | 736                                 | 403   | 36  | 91.1%   |
| Pollution Control       | 10                                  | 4   | 2   | 50%   |
| Private Vessel          | 30                                  | 18  | 12  | 33.3%   |
| Refrigerated Cargo      | 41                                  | 26  | 1   | 96.2%   |
| Research Vessel         | 131                                 | 47  | 17  | 63.8%   |
| Ro-Ro Cargo Ship        | 202                                 | 129   | 7   | 94.6%   |
| Supply Ship             | 159                                 | 91  | 22  | 75.8%   |
| Tug                     | 531                                 | 226   | 117   | 48.2%   |
| Vehicle Carrier         | 912                                 | 615   | 32  | 94.8%   |
| Well Stimulation Vessel | 1                                   | 1   | 1   | 0%  |
| <b>TOTAL</b>            | <b>11,593</b>                       | <b>6,501</b>  | <b>618</b>  | <b>90.5%</b>  |

<sup>7</sup> 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.

<sup>8</sup> Column 2 includes a subset of the S-AIS vessel transits through the sanctuary.

<sup>9</sup> 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.

<sup>10</sup> 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 cooperation 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 2023 data methodology is the same as 2017 through 2022. We continue our analysis by gross tonnage categories, which started in 2017. This way of looking at cooperation allows comparisons from before and after the 2017 changes.

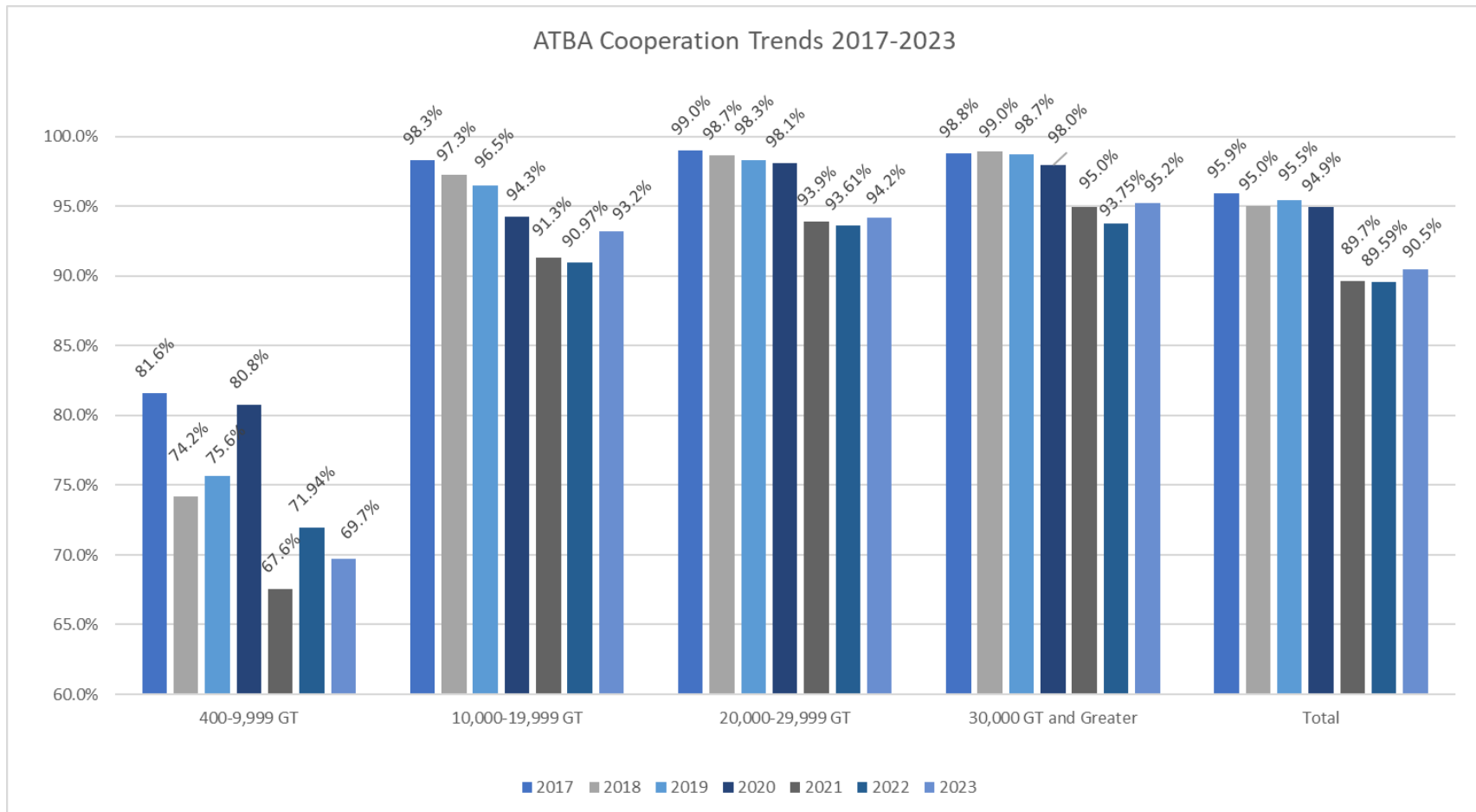
A critical factor in estimating OCNMS ATBA cooperation is the vessel’s gross tonnage. Gross tonnage is not one of the vessel attributes that is included in the AIS data stream, and it must be added in post processing. Gross tonnage, a more objective vessel characteristic than vessel type, should be less sensitive to changes in vessel data source. We reviewed our 2023 data using this additional format, see Table 3.

**Table 3:** 2023 estimated cooperation, by gross tonnage.

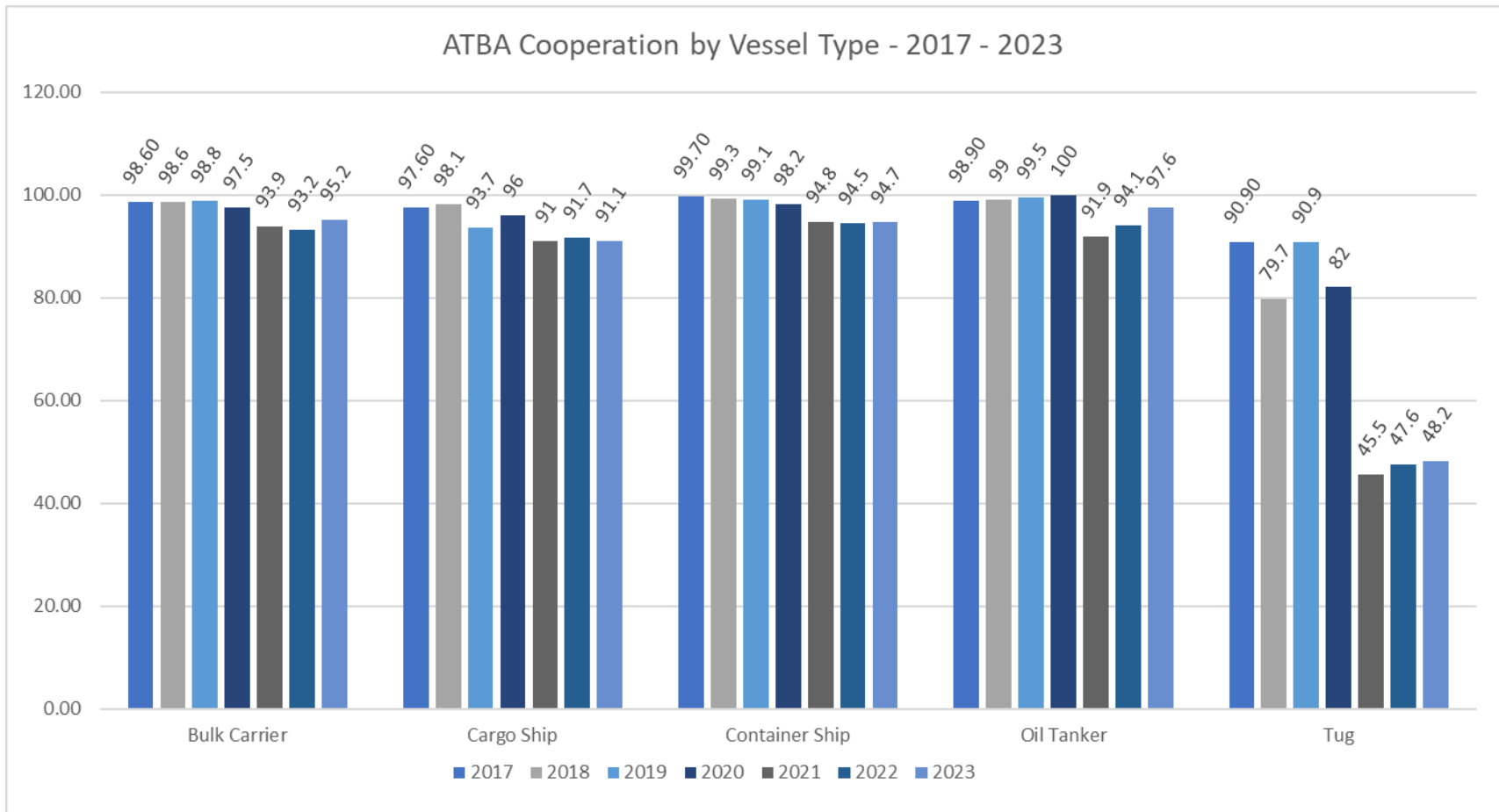
| <b>Gross Tonnage (GT)</b> | <b>Transits passing through the sanctuary</b> | <b>Transits passing through the ATBA within the sanctuary</b> | <b>Estimated ATBA Cooperation Rate</b> |
|---------------------------|---|---|--|
| 400 to 9,999 GT           | 1133  | 343   | 69.7%                                  |
| 10,000 to 19,999 GT       | 206   | 14  | 93.2%                                  |
| 20,000 to 29,999 GT       | 1157  | 67  | 94.2%                                  |
| 30,000 GT or greater      | 4005  | 194   | 95.2%                                  |
| <b>TOTAL</b>              | <b>6,501</b>                                  | <b>618</b>  | <b>90.5%</b>                           |

Figure 2 illustrates vessel cooperation trends over the last seven years. All four categories show drops in cooperation. The smallest category (400-9,999 GT) shows the most variability, without a consistent trend. The 10,000-19,999 GT, 20,000-29,999 GT, and 30,000 GT and greater categories, representing large commercial vessels, show a stable, but lower, trend in cooperation compared to previous years.

Figure 3 shows vessel cooperation trends over the last seven years, for selected types of vessels. All five examples show drops in cooperation between 2020 and 2021, with 2022 and 2023 having overall similar cooperation rates to 2021.



**Figure 2:** Trends in estimated ATBA Cooperation by gross tonnage categories (2017-2023). Credit: NOAA.



**Figure 3:** Trends in estimated ATBA Cooperation by Selected Vessel Types (2017-2023). Credit: NOAA.

## Summary

The estimated cooperation of the ATBA for 2023 is 90.5%, which is consistent with 2021 and 2022 cooperation rates. There was a slight increased cooperation in the larger gross tonnage and for most types of vessels. However, the four years prior to 2021, estimated cooperation was fairly consistent: 95.9% in 2017, 95.0% in 2018, 95.5% in 2019, and 94.9% in 2020. This averages to 95.33% cooperation between 2017 and 2020. There are a number of potential reasons for these changes, which sanctuary staff considered, but for which adequate evidence was beyond the scope of this annual report. This change is of concern and will continue to be monitored. Sanctuary staff plan to explore enhanced education and outreach opportunities to raise awareness of, and cooperation with, the ATBA.

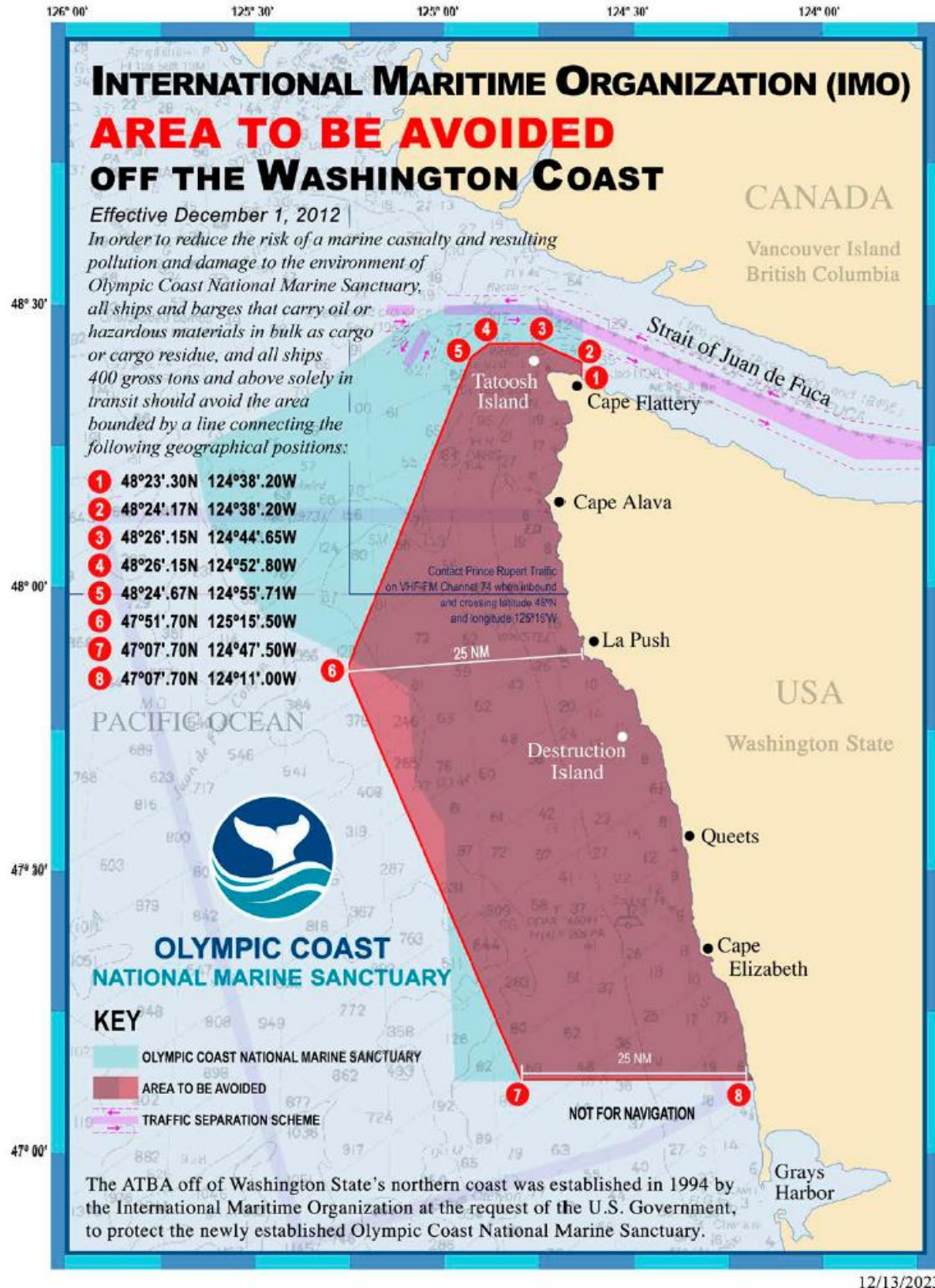


Figure 4: ATBA Information Flyer – Page 1; shows boundary and explains to which vessels it applies. Credit: NOAA.

**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 resources within the sanctuary 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 resources in the sanctuary
- 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 resources within the sanctuary
- 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:**

- More than 100 species of seabirds use 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, and 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, sandy beaches, and offshore rocks and islands
- Within the usual and accustomed fishing grounds of the Hoh Tribe, Makah Tribe, Quileute Tribe, and 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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1519 Alaskan Way S, Seattle, WA 98134  
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<http://www.uscg.mil/dl3/cvts/>

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



12/13/2023

**Figure 5:** ATBA Information Flyer – Page 2; provides rationale for ATBA and information on OCNMS. Credit: NOAA.