



Vessel Transits through Olympic Coast National Marine Sanctuary and Area to be Avoided – 2021 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

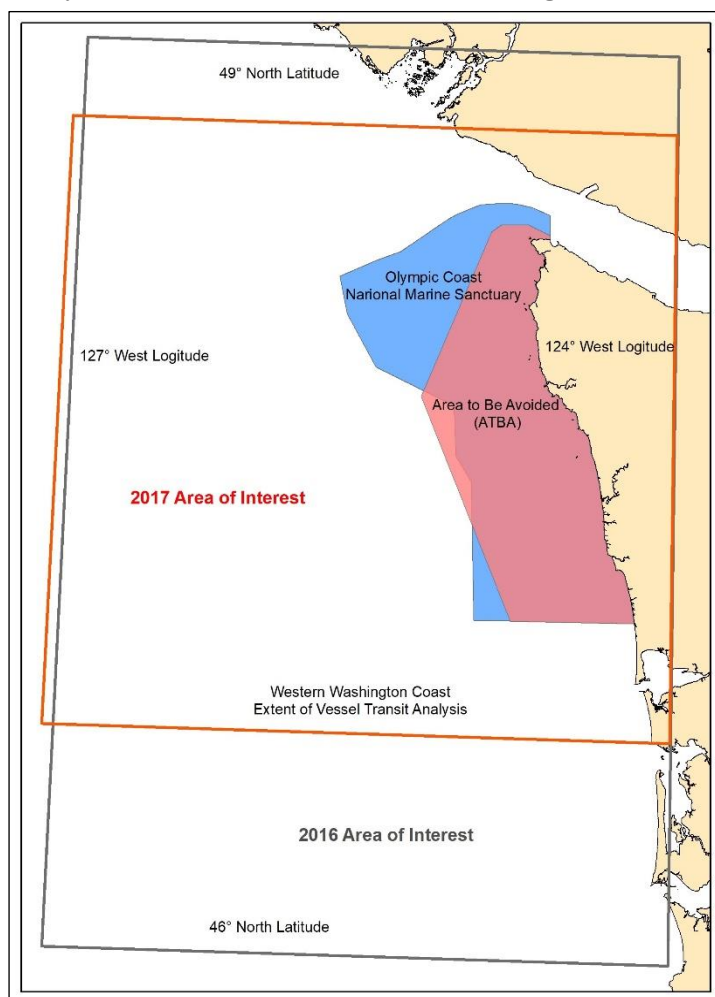


Figure 1: Vessel Transit Analysis Area. Olympic Coast National Marine Sanctuary is shaded in blue and the Area to be Avoided is shaded in red. The larger area of interest from 2012 through 2016 is outlined in gray; the smaller area of interest from 2017-2021 is outlined in red. Credit: NOAA.

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 2021 vessel transits off the Washington coast shows a compliance rate with a significant drop in compliance compared to recent years, 89.7% versus, a relatively consistent rate in the previous 4 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 (Figure 1). For more information on the ATBA see the informational flyer shown in 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 (2012-2021) 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 2021 data was processed in the same manner as 2017 through 2020, 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 2011-2021

2011 Vessel Types	2012-2013 Vessel Types	2014-2021¹ 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 2017-2021 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 AIS data, adding unique transit codes and 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 2021 is 89.7%. These results are further discussed in the following section.

Table 2: Estimated ATBA Compliance Rates for 2021 (vessels > 400 GT)

Vessel Type	Area of Interest ⁶	Transits passing through the sanctuary ⁷	Transits passing through the ATBA within the sanctuary ⁸	Estimated ATBA Compliance Rate ⁹
	1	2	3	4
Articulated Tug Barge	383	342	30	91.2%
Bulk Carrier	3828	2050	125	93.9%
Cable Layer	26	6	3	50.0%
Cargo Ship	552	366	33	91.0%
Chemical Carrier	635	476	17	96.4%
Container Ship	2710	1518	79	94.8%
Dredger	9	2	0	100.0%
Fishing Vessel	822	242	103	57.4%
Liquefied Gas Carrier	62	34	0	100.0%
Oil Tanker	396	284	23	91.9%
Passenger Ship	248	127	15	88.2%
Pollution Control	5	3	1	66.7%
Private Vessel	45	28	21	25.0%
Refrigerated Cargo	35	23	1	95.7%
Research Ship	161	70	30	57.1%
RoRo Cargo Ship	208	132	3	97.7%
Supply Ship	117	67	14	79.1%
Tug	692	290	158	45.5%
Vehicle Carriers	615	494	22	95.5%
TOTAL	11549	6554	678	89.7%

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 2021 data methodology is the same as 2017 through 2020. 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 2021 data using this additional format, see **Error! Reference source not found..**

Table 3: 2021 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	1200	389	67.6%
10,000 to 19,999 GT	207	18	91.3%
20,000 to 29,999 GT	1170	71	93.9%
30,000 GT or greater	3977	200	95.0%
TOTAL	6554	678	89.7%



Figure 2 illustrates vessel compliance trends over the last five years. All four categories show 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, show a significant drop in compliance.

Figure 3 shows vessel compliance trends over the last five years, for selected types of vessels. All five examples show drops in compliance between 2020 and 2021.

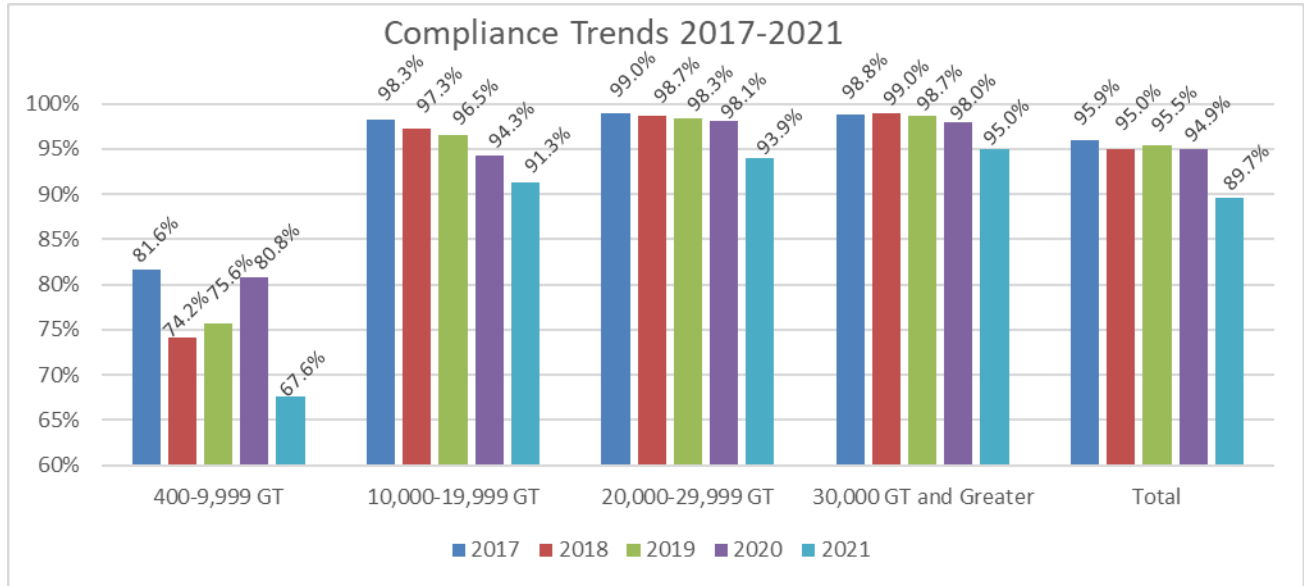


Figure 2: Trends in estimated ATBA Compliance by gross tonnage categories (2017-2021). Credit: NOAA.

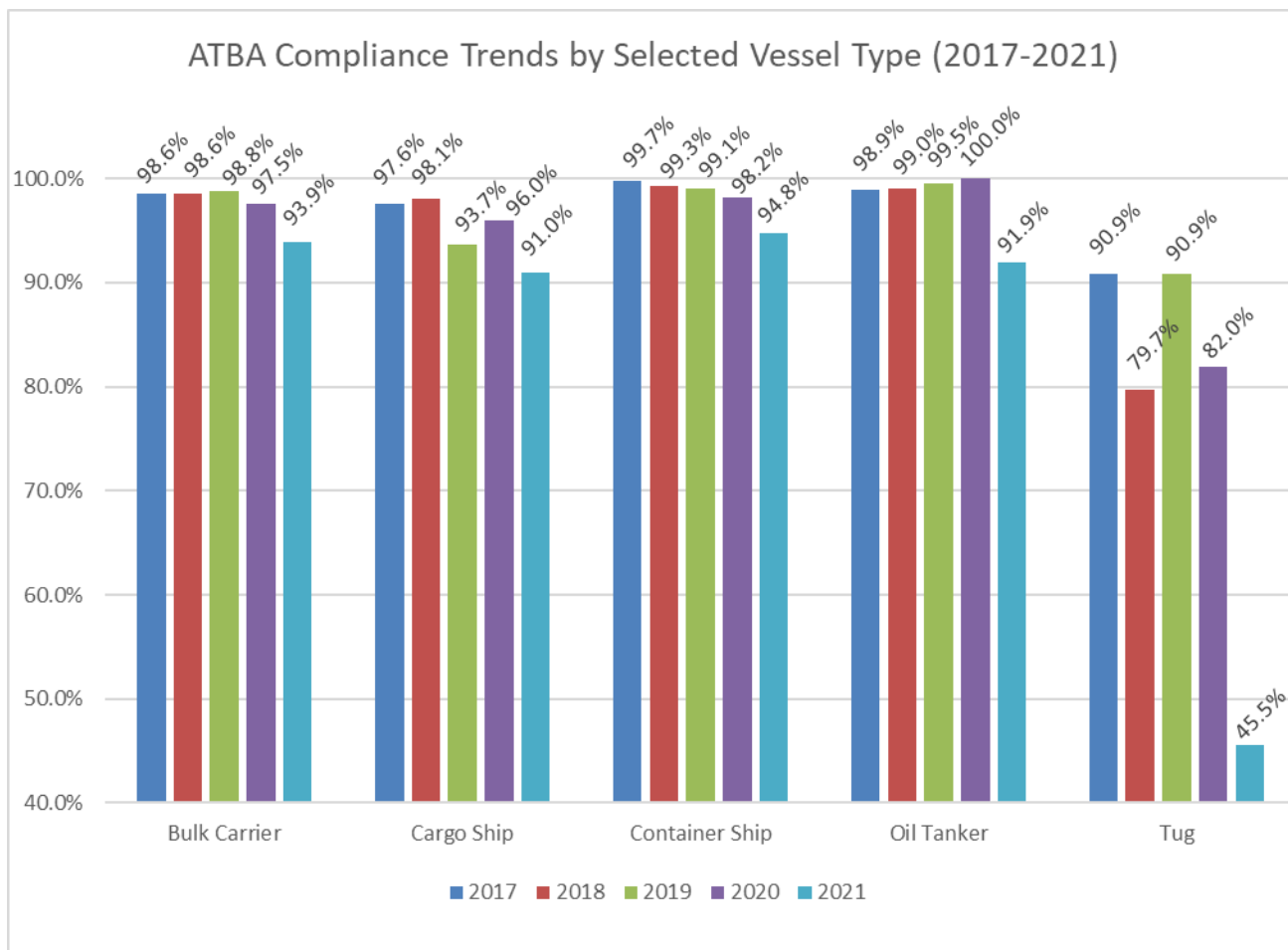


Figure 3: Trends in estimated ATBA Compliance by Selected Vessel Types (2017-2021). Credit: NOAA.

Summary

The estimated compliance of the ATBA for 2021 is 89.7%. This shows a decrease in compliance across all gross tonnage categories, and for most types of vessels. The previous four years estimated compliance was fairly consistent: 95.9% in 2017, 95.0% in 2018, 95.5% in 2019, and 94.9% in 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 observed.

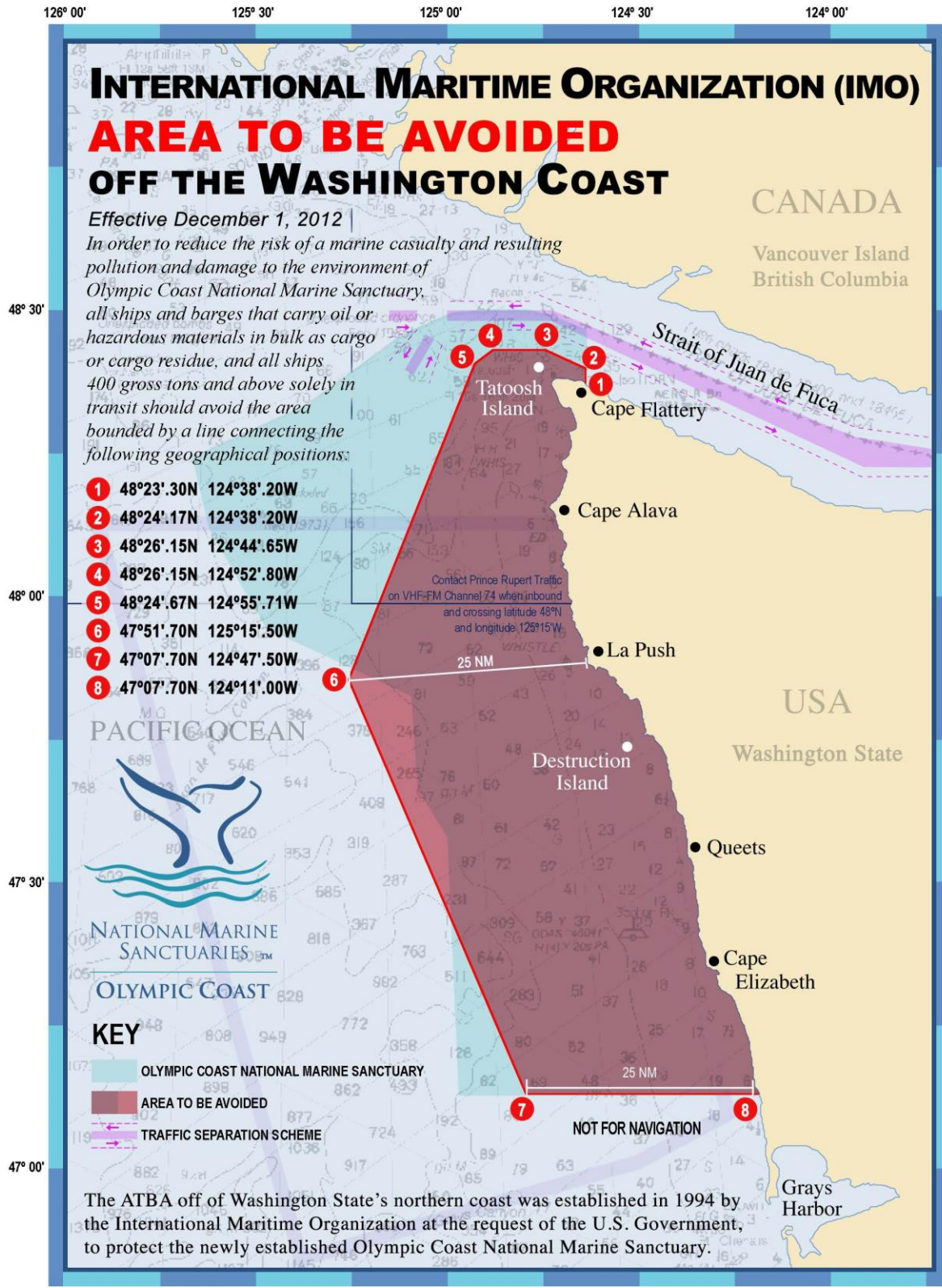


Figure 3: ATBA Information Flyer – Page 1; shows boundary and explains to which vessels it applies. Credit: NOAA.

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.