

Aleutian Islands Risk Assessment

Brief to the Aleutian Islands Risk Assessment Advisory Panel and Management Team

Prepared by: Nuka Research & Planning Group, LLC.

September 2014 | version 1

2012 Transits of UNIMAK PASS





As part of Phase B of the Aleutian Islands Risk Assessment (AIRA), the Analysis Team was charged with recommending options for enhancing oil spill prevention, vessel salvage, and oil spill response in a recommended Optimal Response System for the Aleutian Islands. Developing this recommendation and understanding how it may relate to U.S. oil spill response preparedness regulations requires an understanding of how many vessels transiting the area are subject to those regulations. Vessels that are in “innocent passage” because they are just passing through the region on their way between two foreign ports are exempt from both U.S. federal and State of Alaska oil spill response preparedness regulations.

While a comprehensive vessel traffic study was conducted as part of Phase A of the AIRA (DNV and ERM, 2010), this Phase B report only updates one year of vessel transits through Unimak Pass. It also acknowledges, though does not report actual data on, the fact that many vessels stay south of the archipelago or may cross through the islands using a pass other than Unimak Pass.

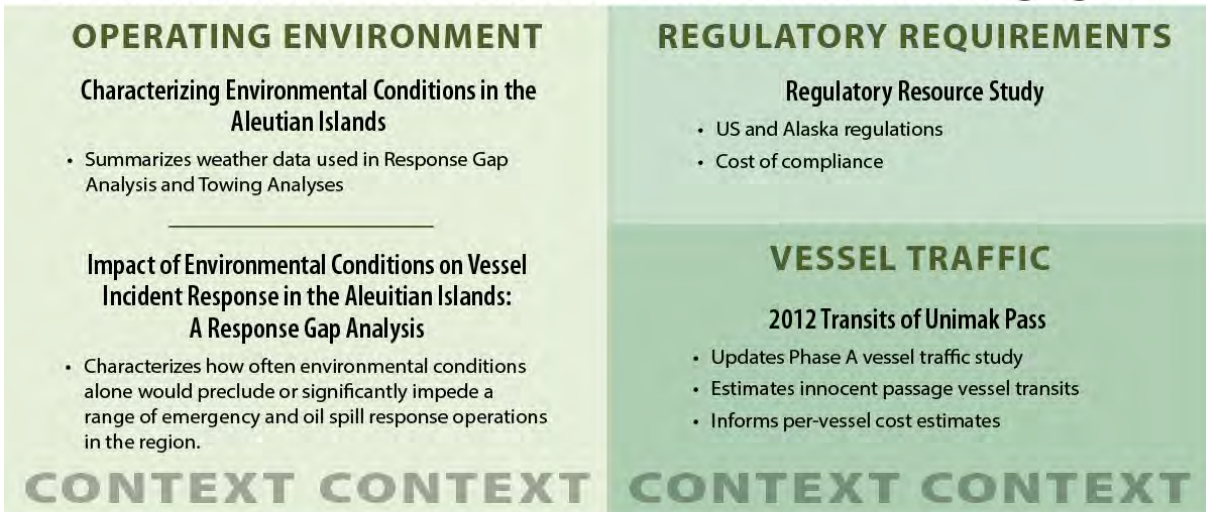
Based Automated Identification System (AIS) data collected by the Marine Exchange of Alaska, there were 4,615 transits by deep-draft vessels through Unimak Pass in 2012. Fifty-three percent (2,462) of recorded transits were in innocent passage, meaning that the vessel would not be required to meet U.S. spill response planning requirements (this includes both tank and non-tank vessels; for the latter, requirements took effect in 2013). For the other 2,016 transits, the vessel made at least one recorded voyage through the region that year that was directly to or from a U.S. port (or it was a U.S.-flagged vessel, which is always subject to the regulations). Looking at unique vessels instead of transits, we see that 1,045 vessels would have been subject to the regulations and 853 vessels made those 2,462 transits in innocent passage. Regulated status could not be determined for 137 recorded transits (representing 63 unique vessels).

Compared to the data included in the Phase A study (DNV and ERM, 2010), there were more vessels transiting Unimak Pass in 2012 than in 2006-2009. Vessel traffic through the pass appears to have surpassed pre-recession levels following a dip in 2008-2009.

Cover Photo: The container ship, M/V Costco Hamburg passes within 1 mile of Etienne Bay on Attu Island while in international passage through the Aleutians (May 27, 2010). *Used with permission. Photo credit: Jeff Williams*

Overview

The AIRA Optimal Response System Summary Report is supported by a series of interrelated studies as shown in the following figure.



OPTIMAL RESPONSE SYSTEM ELEMENTS

EMERGENCY TOWING

Minimum Required Tug Studies

- 2013 study calculates minimum tug bollard pull needed to control representative vessel based on 2010 traffic data.
- 2014 study updates calculation for 75th percentile containership based on 2012 data.

Tug of Opportunity Study

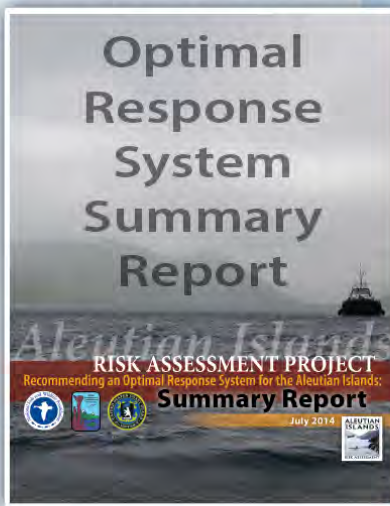
- Calculates the ability of tugs of opportunity in the region to reach various scenario locations and rescue a large ship.

Purpose Designed Towing Vessel

- Presents design and cost estimate for towing vessel intended to maximize features such as speed and seakeeping for Aleutian Islands operations.

Estimated Response Times for Tugs of Opportunity in the Aleutians

- Evaluates availability, capability, and response time for tugs of opportunity to assist 75th percentile containership at various scenario locations based on 2012 tug location data.



Best Available Technology

- Identifies best available technology tugs based on review of existing vessels and set of criteria applicable to Aleutian Islands.

Tug Location Study

- Presents geographic areas that can or cannot be reached by tugs based at different locations in the Aleutian Island.

SPILL RESPONSE & SALVAGE

Considering Options for Salvage & Oil Spill Response in Optimal Response System

- Describes approach used to identify spill response and salvage resources and system components for recommended system.

BENEFITS, COSTS, & IMPLEMENTATION

Benefit-cost Analysis of Risk Reduction Options

- Analyzes predicted benefits and costs and concludes that predicted benefits of proposed system will exceed costs of system implementation.

Considering Options for the Management & Funding of an Optimal Response System

- Describes approach used to identify nonprofit model for recommended system.

2012 Transits of UNIMAK PASS



AUTHORS

Nuka Research and Planning Group, LLC

TABLE OF CONTENTS

Executive Summary	2
Overview	3
1. Introduction	5
1.1 Federal Response Plan Requirements and Innocent Passage	5
2. Methodology	6
3. Results	6
3.1 Transits by Direction	6
3.2 Vessel Transits in Innocent Passage	7
3.3 Unique Vessels in Innocent Passage	7
3.4 Vessel Type	8
3.5 Summary of 2012 Vessel Traffic Based on Unimak Pass Data	9
3.6 Examples of Vessels Transiting Unimak Pass in Innocent Passage and those Subject to U.S. VRP Requirements	10
4. Comparing 2012 Unimak Pass Traffic to Recent Years	11
5. Conclusion	12
6. References	13

1. INTRODUCTION

As part of the Aleutian Islands Risk Assessment (AIRA), the Analysis Team was charged with recommending options for enhancing oil spill prevention, vessel salvage, and oil spill response in a recommended Optimal Response System for the Aleutian Islands. Developing this recommendation and understanding how it may relate to U.S. regulations requires an understanding of how many vessels transiting the area are subject to those regulations and therefore taking steps to ensure a baseline level of response preparedness should they have an accident in the region.

The purpose of this report is to present the vessel transit data through Unimak Pass in 2012 based on Automated Identification System (AIS) data collected by the Marine Exchange of Alaska. This data was acquired in order to estimate how many of the deep-draft vessels using the pass are in innocent passage, meaning that they are not subject to U.S. regulations for oil spill preparedness in the region.

This report provides an update to the Unimak Pass transit data in the 2010 study conducted by DNV and ERM for Phase A of the AIRA. It does not seek to fully update this 2010 report and is not a comprehensive vessel traffic study.

1.1 Federal Response Plan Requirements and Innocent Passage

The U.S. Coast Guard requires that certain tank and non-tank vessels have Vessel Response Plan (VRP) and Non-Tank Vessel Response Plan (NTVRP) in place, ensuring either that a specified (and variable) quantity of response resources can be on-scene within set time limits, or at least that the services are, or can be, contracted quickly when needed. Vessels transiting U.S. waters that are subject to these requirements must meet requirements for all Captain of the Port Zones through which they travel.

However, as part of customary maritime law, foreign-flagged vessels are allowed to pass through another nation's Exclusive Economic Zone (EEZ) without being subject to regulations or having their way impeded. Thus, the U.S. Coast Guard's regulations *exempt* any non-U.S.-flagged vessels traveling between two foreign ports from the requirements mentioned above. The State of Alaska mimics this policy, and exempts any vessels that are not traveling to or from an Alaska port from its spill prevention and response requirements. For more information, see the Regulatory Resource Study conducted for the AIRA (Nuka Research et al., 2013).

For the purpose of this report, Nuka Research refers to vessels as being in innocent passage in 2012 if they did not make any recorded transits through Unimak Pass in 2012 that were either directly *to* or *from* a U.S. port. (They may have made other calls to U.S. ports requiring a VRP, but would not have had to ensure any level of coverage in the Western Alaska Captain of the Port Zone.) Vessels referred to as requiring a VRP (or NTVRP) are those that made at least one trip through Unimak Pass in 2012 that was directly to or from a U.S. port. That port could have been in Alaska or another U.S. state.

Non-tank vessel plans were not required by regulations until 2013; thus, we use 2012 vessel traffic as a proxy for “current” levels of traffic when in fact the non-tank vessels would not have been subject to NTVRP regulations at the time the AIS data were collected.

2. METHODOLOGY

Nuka Research summarized Automated Identification System (AIS) data provided by the Marine Exchange of Alaska for deep-draft vessels transiting Unimak Pass in 2012 to better understand the number and type of vessels crossing a passage line at Unimak Pass. AIS data was obtained for Unimak Pass only. In effort to ensure that it captures all deep-draft vessels in international trade, but not those serving local ports or other functions, it excludes fishing, military, ferry, vessels, tugs or barge vessels, U.S. Coast Guard vessels, those engaged in Arctic drilling activities (present in the region in 2012), or smaller vessels that are not equipped with AIS (Marine Exchange, 2013). Vessels will also use other passes or stay south of the Aleutian Islands. When they do this they typically still pass through the U.S. Exclusive Economic Zone, and are thus subject to U.S. regulatory requirements to have include the Western Alaska Captain of the Port Zone in their Vessel Response Plan, unless in innocent passage.

For each transit, AIS data on the vessels’ next and last ports of call were used to determine whether the vessel was departing from (westbound) or destined to (eastbound) a U.S. port. Of the 4,615 transits recorded through Unimak Pass, Nuka Research could not determine whether the vessel was in innocent passage for 137 transits based on the information included in the data. These are noted as “unknown” in the data summary tables.

Unimak Pass is the primary, though not only, pass used by large vessels engaged in international commerce. Some vessels are known to stay south of the island chain depending on their route and current or forecasted weather conditions (DNV and ERM, 2010). AIS data from shore-based stations near Unimak Pass provided the information needed on the vessel flag state, destination, and point of departure, which are the key information to determining whether the vessel is in innocent passage.

3. RESULTS

In 2012, a total of 1,961 deep-draft vessels made 4,615 recorded transits through Unimak Pass.

3.1 *Transits by Direction*

The data for Unimak Pass indicate that this route through the pass is more commonly used for westbound voyages:

- 3,109 (67%) of recorded transits through Unimak Pass were WESTBOUND
- 1,369 (30%) of recorded transits through Unimak Pass were EASTBOUND
- 137 (3%) transits were unknown

In addition to Unimak Pass, vessels may also use other passes or, more commonly, stay south of the islands. To provide a general illustration of the number of vessels that may be moving south of the Aleutian Islands, we assume that vessels identified as traveling twice in the same direction consecutively also made a trip in the opposite direction in between those recorded journeys through Unimak Pass. Based on this assumption, there were 963 eastbound voyages south of the Aleutian Islands and 87 westbound voyages in addition to the recorded transits reported above. This assumption may still miss some vessels, however, if they make a round trip between East Asia and Western North America without passing through Unimak Pass in either direction. It may also errantly include vessels that actually did travel elsewhere in the world before returning to North Pacific transit. It is therefore a rough estimate for illustrative purposes only. These vessels are not included in any estimates of system costs developed for the project, as the numbers are rough estimates only.

3.2 Vessel Transits in Innocent Passage

For 2,462 (53%) of recorded transits through Unimak Pass, vessels were in innocent passage and would not be required to have a U.S. VRP or NTVRP plan that includes the Western Alaska Captain of the Port Zone. Another 2,016 transits would have been subject to U.S. VRP or NTVRP (as of 2013) requirements for area, because they were traveling to or from a U.S. port (or were a U.S.-flagged vessel) for at least one recorded voyage through the region that year. Regulated status could not be determined for 137 recorded transits.

3.3 Unique Vessels in Innocent Passage

A total of 1,961 unique large vessels were recorded passing through Unimak Pass in 2012. Of these: 1,045 vessels would have been subject to VRP or NTVRP regulations for at least one transit during the year. (Vessels making multiple transits across the North Pacific may have different ports of departure and destinations.) There were 853 vessels that transited Unimak Pass only in innocent passage (i.e., never to or from a U.S. port when on this route). For 63 vessels, AIS data was not conclusive as to whether they were subject to VRP regulations or in innocent passage. This is summarized in Table 1.

Table 1. Summary of unique vessels transiting Unimak Pass in 2012; presents 2012

REGULATED STATUS	# of Unique Vessels
Vessels in U.S. trade only, subject to VRP regulations	684
Vessels in <u>both</u> U.S. trade and innocent passage, subject to VRP regulation for at least one voyage	361
<i>Vessels that would be subject to U.S. regulations for at least one transit through Unimak Pass based on 2012 data</i>	1045
Vessels in <u>innocent passage only</u>	853
Vessels for which regulated status is unknown	63
<i>TOTAL unique vessels transiting Unimak Pass in 2012</i>	1961

3.4 Vessel Type

Ninety-seven percent of the 1,961 vessels recorded were non-tank vessels (including bulkers, container ships, and others). There were also some tank vessels. The breakdown of vessels is summarized in Table 2.

Table 2. Summary of vessel types transiting Unimak Pass in 2012, both those that made at least one voyage where a U.S VRP was required and those transiting ONLY in innocent passage that year

REGULATED STATUS	TANK VESSELS	NON-TANK VESSELS		
		Bulker	Container	Other
Vessels in <u>both</u> U.S. trade and innocent passage, subject to VRP regulation for at least one voyage	15	1030	335	133
Vessels in innocent passage only	36	594	113	110
Vessels for which regulated status is unknown	1	26	31	5
TOTAL	52 (3%)	1182 (60%)	479 (24%)	248 (13%)

Table 3 shows the transits made by vessel type as reported in the AIS data, using a more detailed breakdown of the types of vessels that made 50 or more recorded transits through Unimak Pass in 2012.

Table 3. Vessel types making more than 50 transits through Unimak Pass in 2012

Vessel Type	RECORDED TRANSITS
Bulk carrier	2192
Container	1780
Vehicle carrier	303
General cargo	164
Tankers	82
Other vessels	94
TOTAL	4615

3.5 Summary of 2012 Vessel Traffic Based on Unimak Pass Data

Figure 1 presents a summary of the vessel traffic recorded through Unimak Pass and traffic estimated to be traveling south of the island chain based on the Unimak Pass traffic.

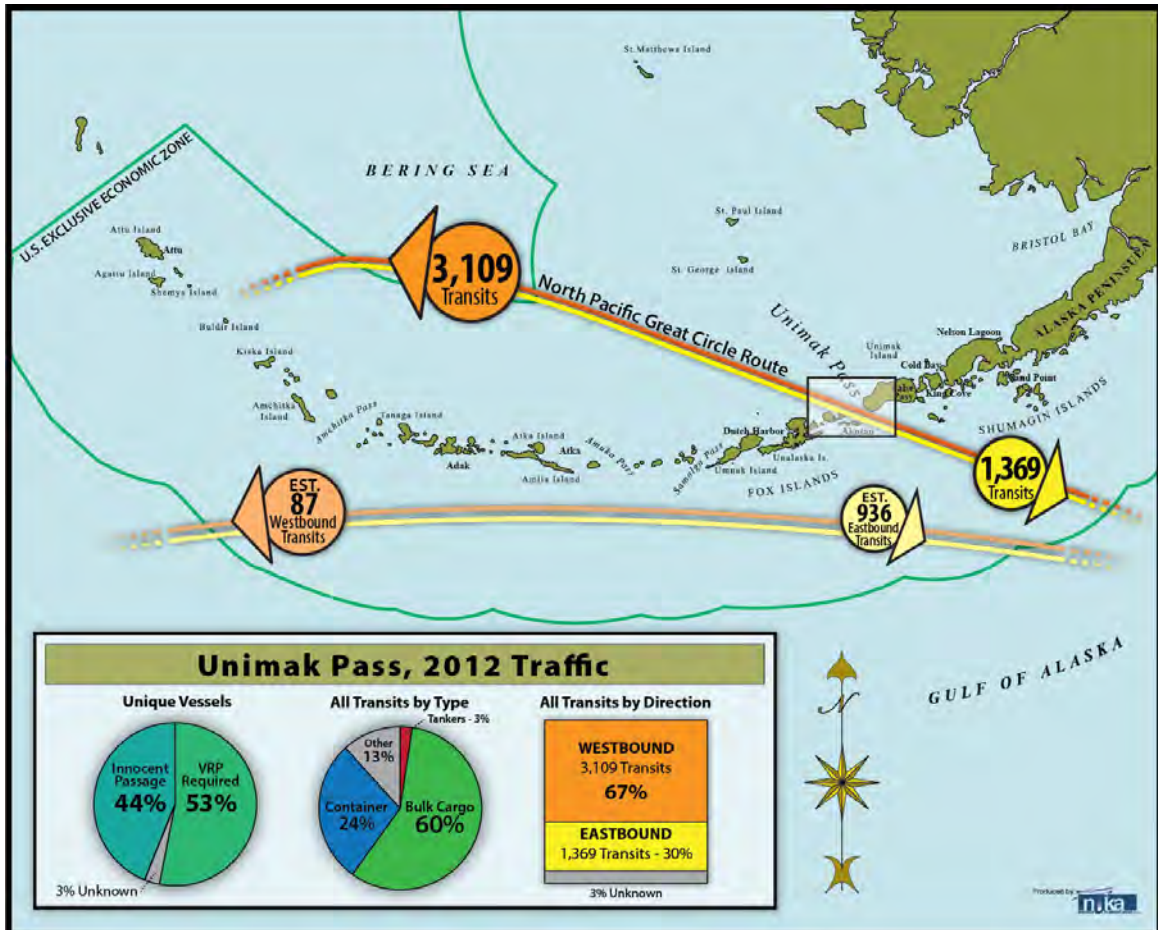








Figure 1. Summary of Unimak Pass traffic recorded in 2012, including percentage of vessels in innocent passage and by vessel type; also includes estimated transits south of the island chain based on number of vessels going through Unimak Pass (routes are idealized; vessels may not follow these exact routes)

3.6 Examples of Vessels Transiting Unimak Pass in Innocent Passage and those Subject to U.S. VRP Requirements*

Innocent Passage	Regulated Passage
 <p>The Liberian-flagged bulk carrier <i>Umang</i> transited Unimak Pass in innocent passage in 2012. (Photo credit: Claus Schafe)</p>	 <p>The <i>Maori Maiden</i>, registered in the Philippines, is an example of a bulk carrier that transited Unimak Pass in 2012 and would now be subject to U.S. VRP regulations for non-tank vessels, which took effect in 2013. (Photo credit: Dieter)</p>
 <p>The Singapore-flagged <i>APL Turquoise</i> is a container ship that transited Unimak Pass in 2012 in innocent passage. (Photo credit: Graham Flett)</p>	 <p>The German-flagged <i>Stuttgart Express</i> is a containership that passed through Unimak Pass in 2012. Because at least one of its several voyages through the area included stopping at a U.S. port, it would be subject to U.S. VRP regulations if it followed identical routes after the VRP regulations for non-tank vessels took effect in 2013. (Photo credit: Mary Duerinck)</p>
 <p>The Norwegian-flagged <i>Champion Trust</i> is a tanker that transited Unimak Pass in 2012 in innocent passage. (Photo credit: Art van Bezooijen)</p>	 <p>Panamanian-flagged <i>Asian Jasper</i> is a tanker that passed through Unimak Pass in 2012 subject to U.S. VRP requirements. (Photo credit: David Wallace)</p>

* All photos have been used with permission.

4. COMPARISON TO RECENT YEARS

There were more recorded transits through Unimak Pass in the calendar year of 2012 than those recorded in any of the fiscal years (October 1 – September 30) 2006-2009 as reported in Phase A (DNV and ERM, 2010). Fiscal year 2007 came the closest to the current number of transits, indicating that traffic has returned to pre-recession (2008-2009) levels, and continued to increase. Table 4 summarizes the recorded transits from that report and this update.

Table 4. Vessels recorded through Unimak Pass in 2006-2009 fiscal years (Oct 1- Sept 30) in DNV and ERM, 2010 and 2012 calendar year

FISCAL YEAR, unless noted	TRANSITS		
	Westbound	Eastbound	Total
2006	2923	568	3491
2007	3851	890	4471
2008	3274	957	4231
2009	2886	1088	3974
2012 (calendar year) ¹	3109	1369	4615

¹ Vessel direction could not be determined for 137 recorded transits. This number is included in the total number of transits for 2012, so the westbound and eastbound transit numbers do not sum correctly.

5. CONCLUSION

Almost 2,000 large, commercial vessels made more than 4,000 trips through Unimak Pass in 2012, based on AIS data. Almost half of these vessels were in innocent passage because they were traveling between two foreign ports and were therefore exempt from U.S. federal or State of Alaska requirements. Of the vessels using Unimak Pass, and therefore captured in that dataset, we estimate that more than 1,000 additional transits were made by vessels that stayed south of the islands, or possibly used an alternate pass to cross through the islands. The vessel traffic recorded in Unimak Pass represents an increase over traffic through the same area in recent years.

REFERENCES

- Marine Exchange of Alaska. (2013). *Aleutian Islands maritime traffic report: Calendar year 2012*. April.
- Det Norske Veritas & ERM-West, Inc. (2010). *Task 1: Semi-quantitative traffic study report*. Aleutian Islands Risk Assessment Phase A.
- Nuka Research and Planning Group, LLC. (2014a). *AIRA Recommending an Optimal Response System for the Aleutian*
- Nuka Research and Planning Group, LLC. (2013). *West Coast spill response study, volume 2: Vessel traffic study*.