

# **Puget Sound 2015 Vessel Traffic Risk Assessment**

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Spills Prevention  
Department of Ecology

18 October 2016

# Agenda

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- Background
- VTRA Study Area
- 2015 VTRA Summary
- 2015 Base Case and What-if Case Results
- Risk Mitigation Measures
- Next Steps

# Puget Sound 2015

## Vessel Traffic Risk Assessment

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- **Authorization**

- Funded through fiscal note, EPA NEP grant

- **Purpose**

- Update the 2010 Puget Sound Vessel Traffic Risk Assessment in order to:
  - Maintain the accuracy and usefulness of the VTRA model;
  - Produce a final report and analysis presentations that will help inform recommendations and actions by federal, state, tribal, and local governments; industry; environmental groups; and the public to reduce the potential for oil spills in the Puget Sound

# Puget Sound 2015

## Vessel Traffic Risk Assessment

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- **Project Roles**
  - Ecology
    - Project sponsor and lead
  - GWU/VCU
    - Contractor conducting assessment
    - Final report and presentations
  - Puget Sound HSC Workgroup
    - Voluntary group of tribes, industry, government, environmental groups
    - Provides input using consensus-based process

# Puget Sound 2015

## Vessel Traffic Risk Assessment

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- Acknowledgements - the 2015 VTRA would not have been possible without the dedication and hard work of many people, including:
  - Members of the workgroup
  - Captain Moreno, who served as workgroup chair
  - John Veentjer, who provided meeting locations and logistics
  - Dr. Van Dorp and Dr. Merrick

# Puget Sound 2015 Vessel Traffic Risk Assessment

Workgroup Input  
and Feedback



GWU/VCU analysis and modeling

# Caveats

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- This presentation is the result of an initial review of the VTRA 2015 Risk Mitigation Measure presentations:  
([https://www.seas.gwu.edu/~dorpjr/VTRA\\_2015/VTRA\\_2015\\_Presentations.html](https://www.seas.gwu.edu/~dorpjr/VTRA_2015/VTRA_2015_Presentations.html))
- It does not address all of the information in Dr. Van Dorp's presentations, or substitute for the analysis done by Dr. Van Dorp and Dr. Merrick
- The intended use for this presentation is to contribute to the discussions at the Salish Sea Oil Spill Risk Mitigation Workshop
- This presentation is a working document, and does not represent official Ecology positions

# 2015 VTRA Summary

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- 2015 VTRA included
  - Base case reflecting 2015 vessel traffic in the study area
  - Potential future scenarios, including a “what-if” case that modeled the effects of adding 1,600 cargo ships and tank vessels, 177 bunkering transits to current traffic
  - Risk mitigation measures, to explore possible ways of preventing oil spills

# 2015 VTRA Summary

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- Portfolio of five risk mitigation measures (5RMM) showed the greatest reduction of potential oil loss, compared to 1,600 vessel what-if case
  - 53.2% reduction in “base case potential oil loss”
- Four of five RMMs were modeled individually
  - Appears the RMM not modeled individually contributed the most to risk reduction

# 2015 VTRA Summary

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- RMM 1 attempts to model effects of pending improvements to vessels and the maritime transportation system
  - Protected fuel tanks
  - Fishing vessel inspections
  - Increased AIS carriage
  - 46 CFR Subchapter M
  - Vessel Traffic System
- Cannot determine individual contribution of individual components from analysis results
- Results rely on assumptions about the possible effects of these changes
- However, the results suggest that working towards the kinds of effects shown in the model could help reduce future risks

# Puget Sound 2015 Vessel Traffic Risk Assessment

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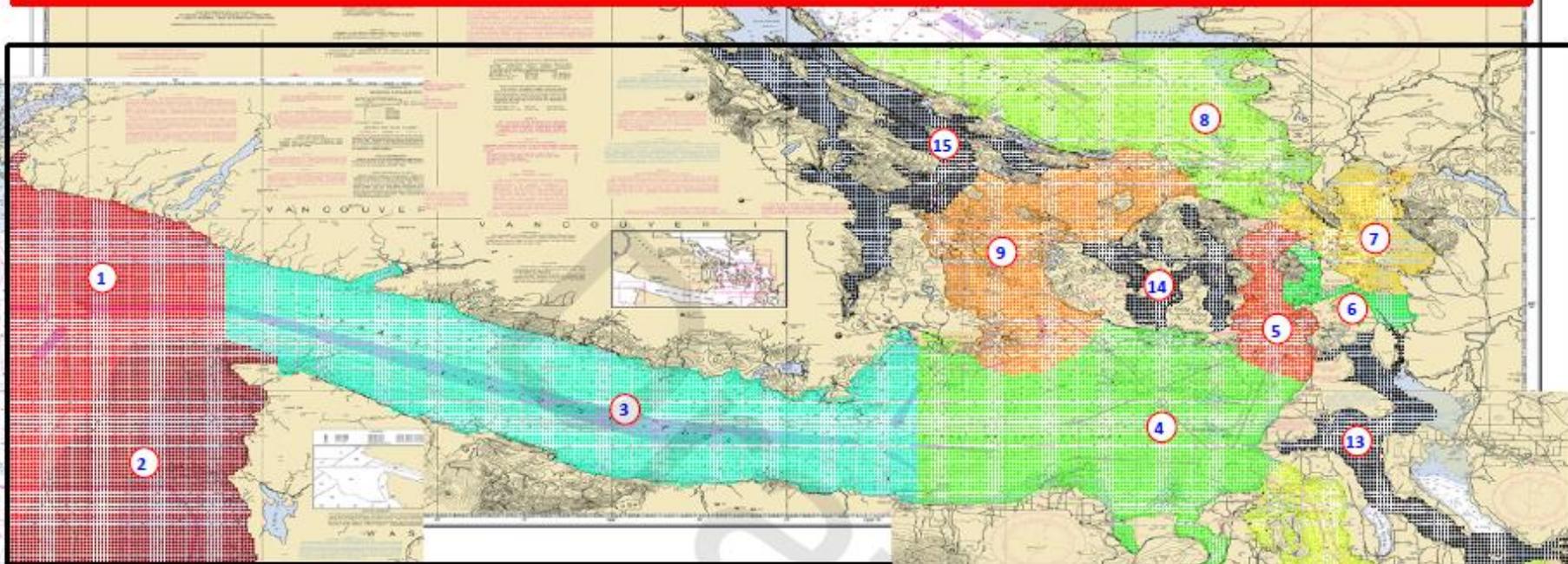
- **Tasks**

- **Develop 2015 Base Case**
- Update 2010 What-If Cases; compare to 2015 Base Case
- Define 2015 What-If Cases; compare to 2015 Base Case
- Define 2015 Risk Mitigation Measures; compare to 2015 Base Case
- Prepare final report

# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2015

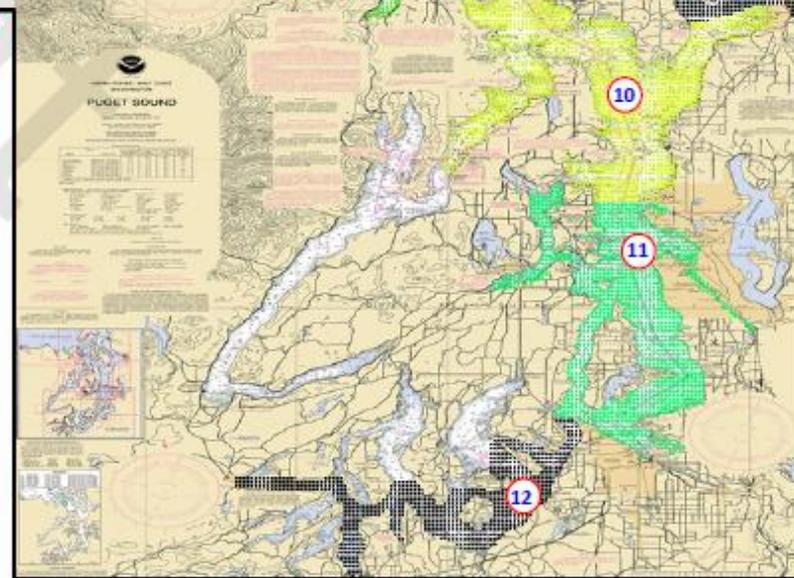


# DEFINITION OF 15 WATERWAY ZONES

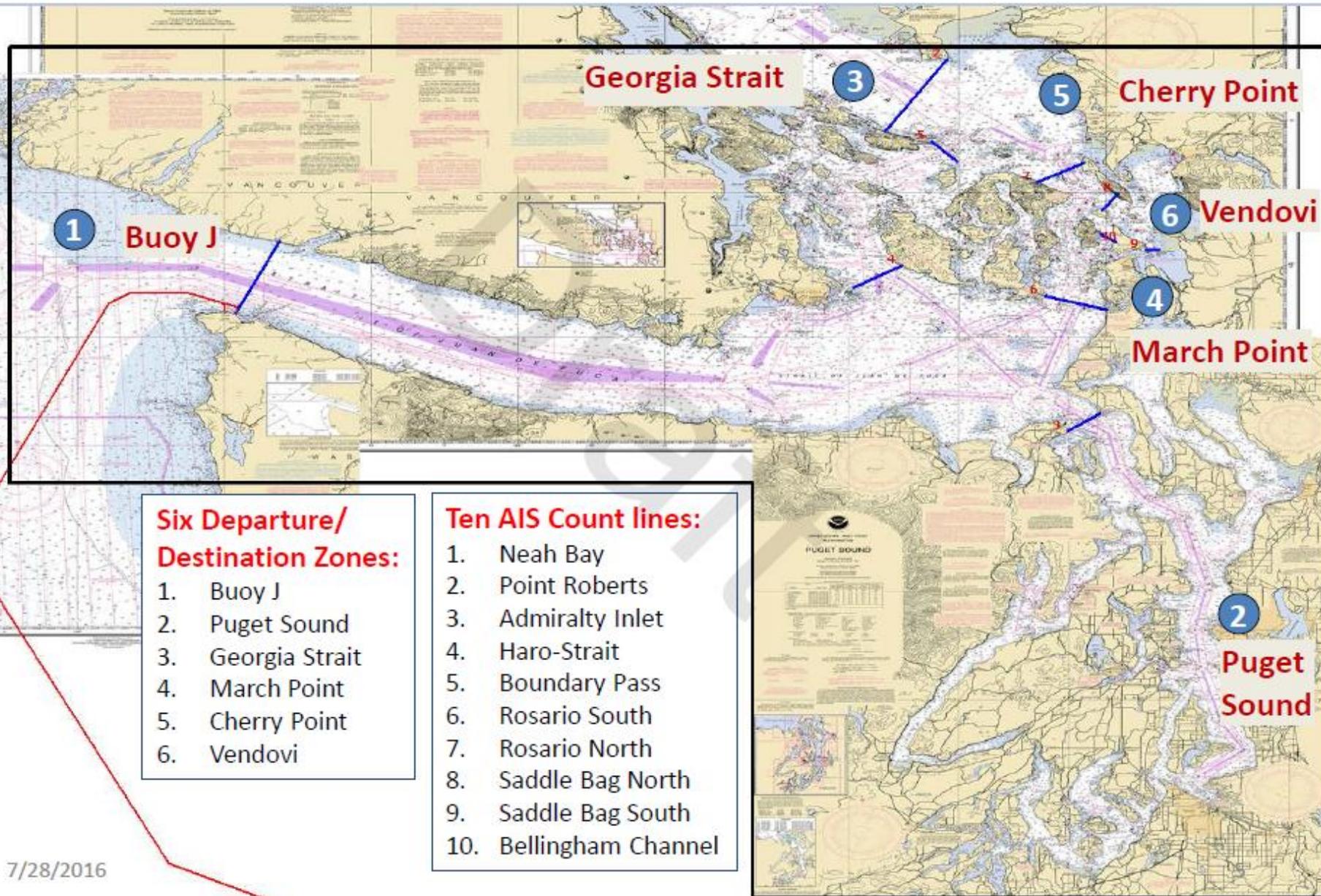


## VTRA 2015 Waterway Zones

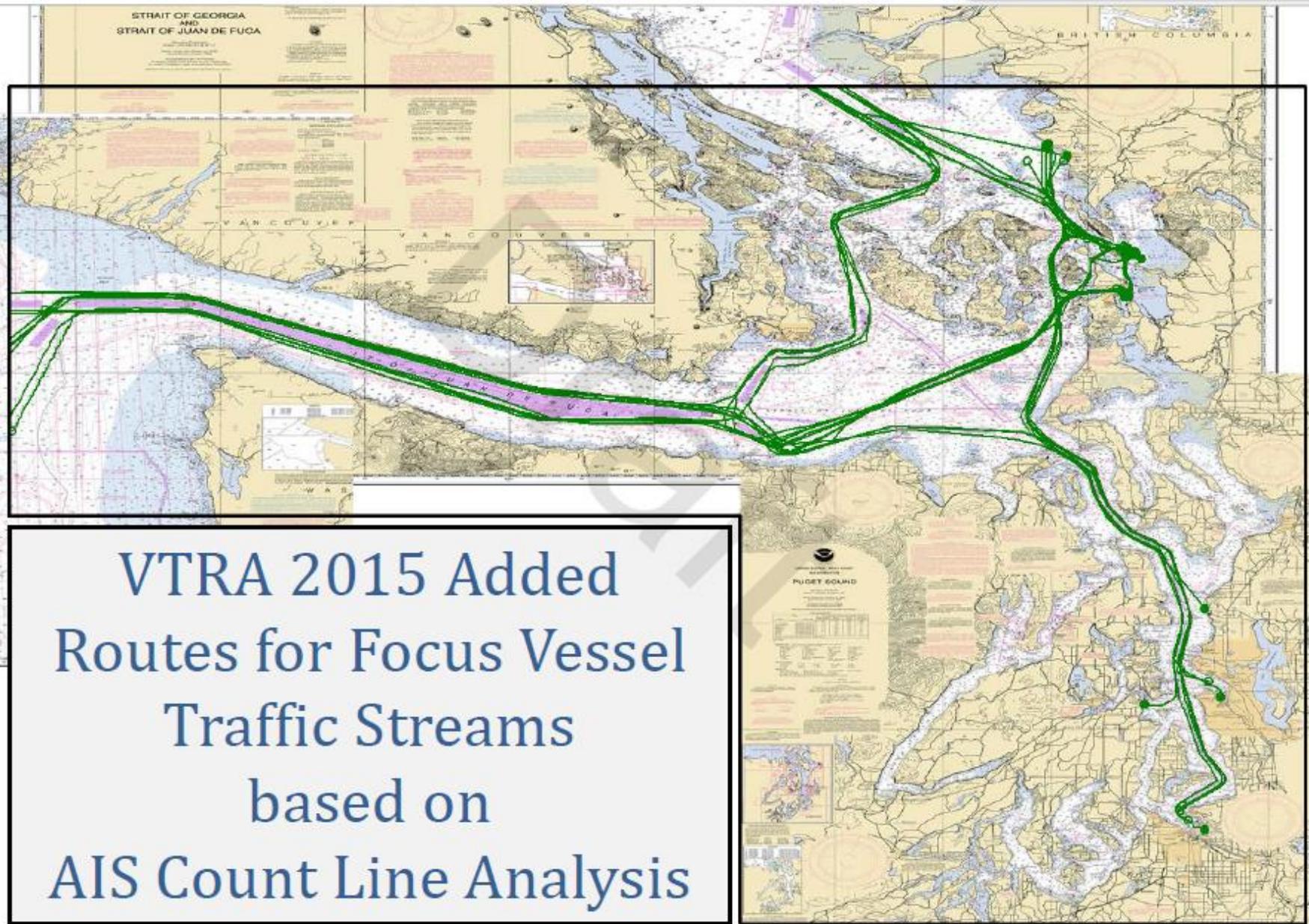
- |                 |                           |
|-----------------|---------------------------|
| 1. Buoy J       | 9. Haro/Boun.             |
| 2. ATBA         | 10. PS North              |
| 3. WSJF         | 11. PS South              |
| 4. ESJF         | 12. Tacoma                |
| 5. Rosario      | 13. Sar/Skagit            |
| 6. Guemes       | 14. SJ Islands            |
| 7. Saddlebag    | 15. Southern Gulf Islands |
| 8. Georgia Str. |                           |



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA 2015)



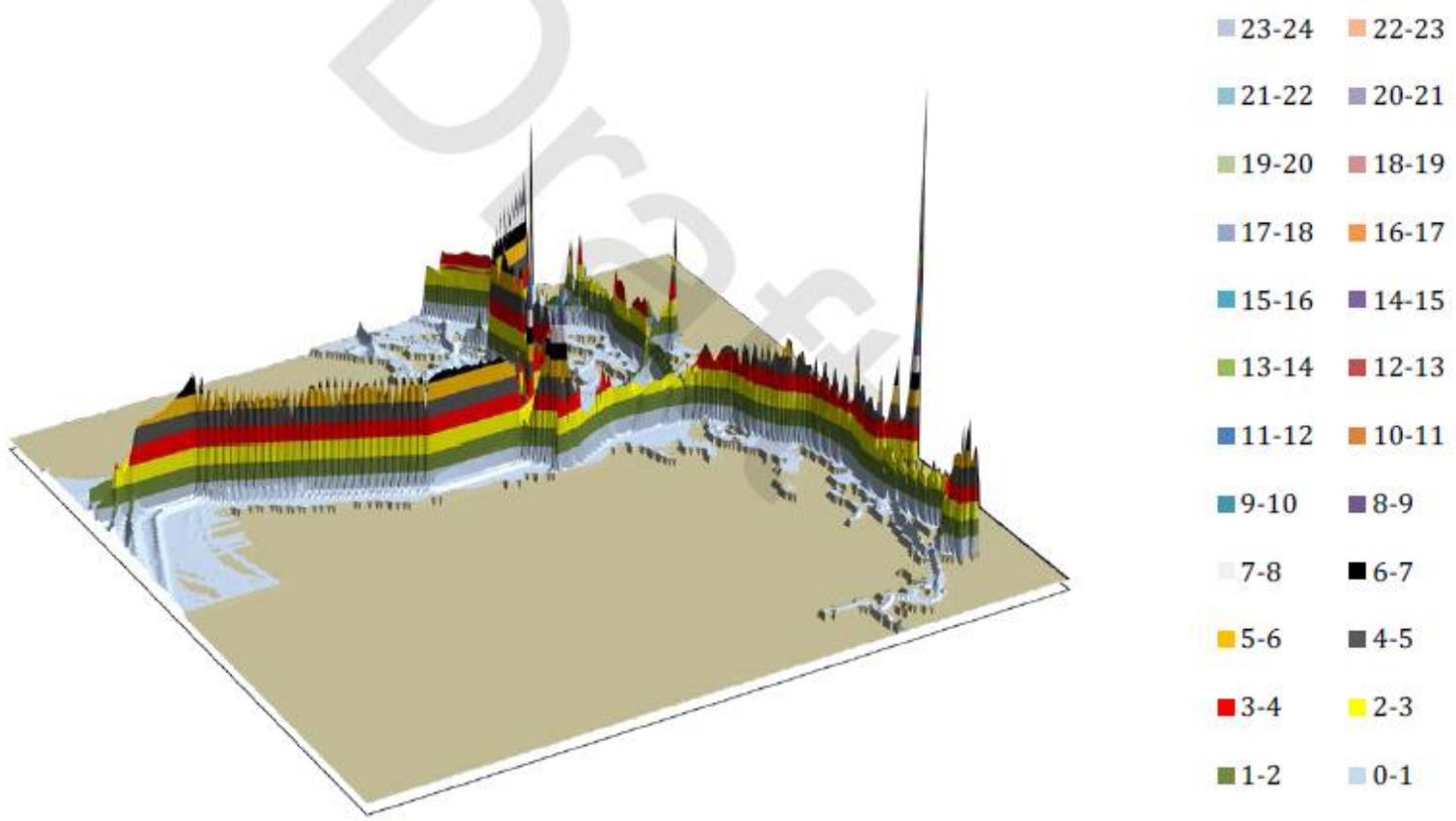
# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2015



VTRA 2015 Added  
Routes for Focus Vessel  
Traffic Streams  
based on  
AIS Count Line Analysis

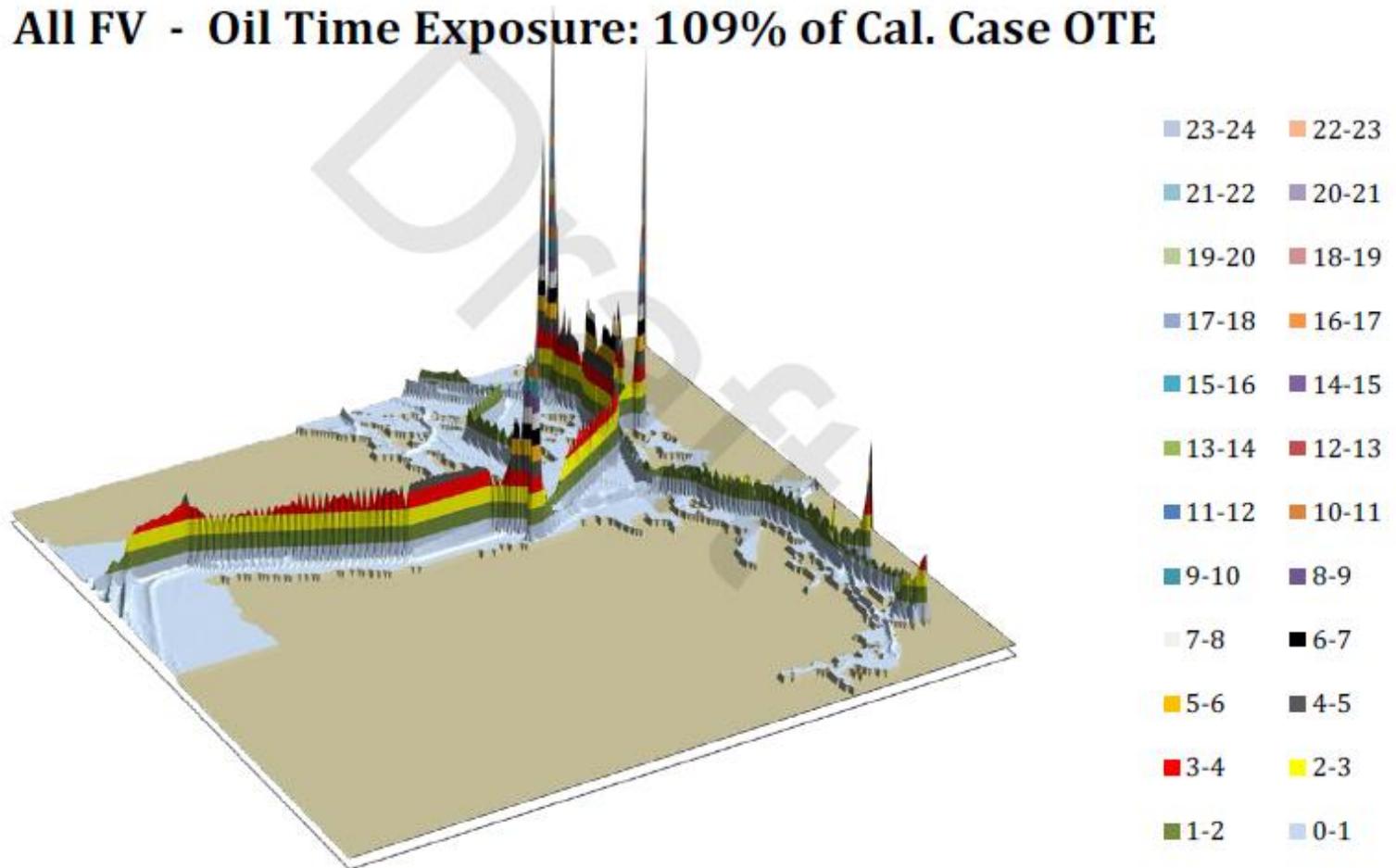
## VTRA '15 Base Case Vessel Time Exposure (VTE)

**VTRA '15: Base Case 3D Risk Profile**  
**All FV - Vessel Time Exposure: 104% of Cal. Case VTE**



## VTRA '15 Base Case Oil Time Exposure (OTE)

**VTRA '15: Base Case 3D Risk Profile**  
**All FV - Oil Time Exposure: 109% of Cal. Case OTE**



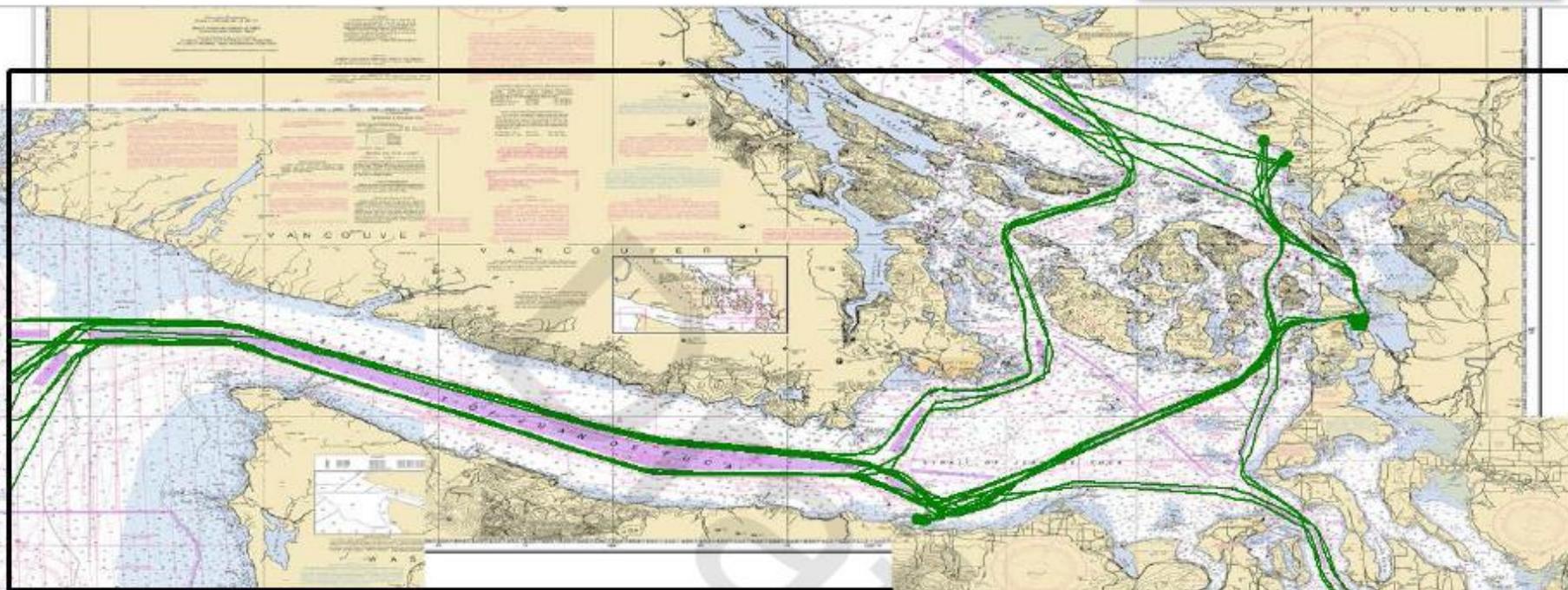
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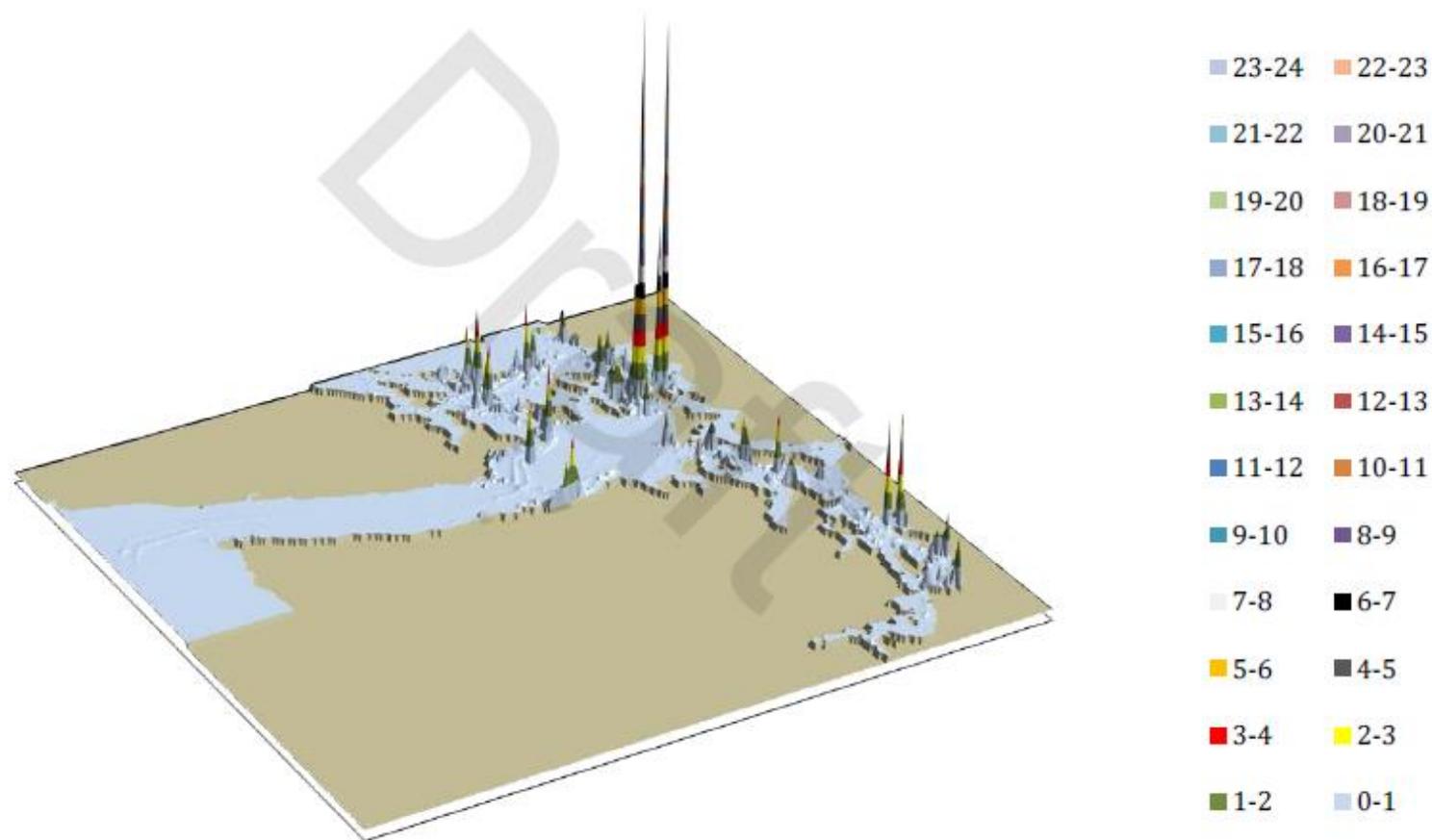
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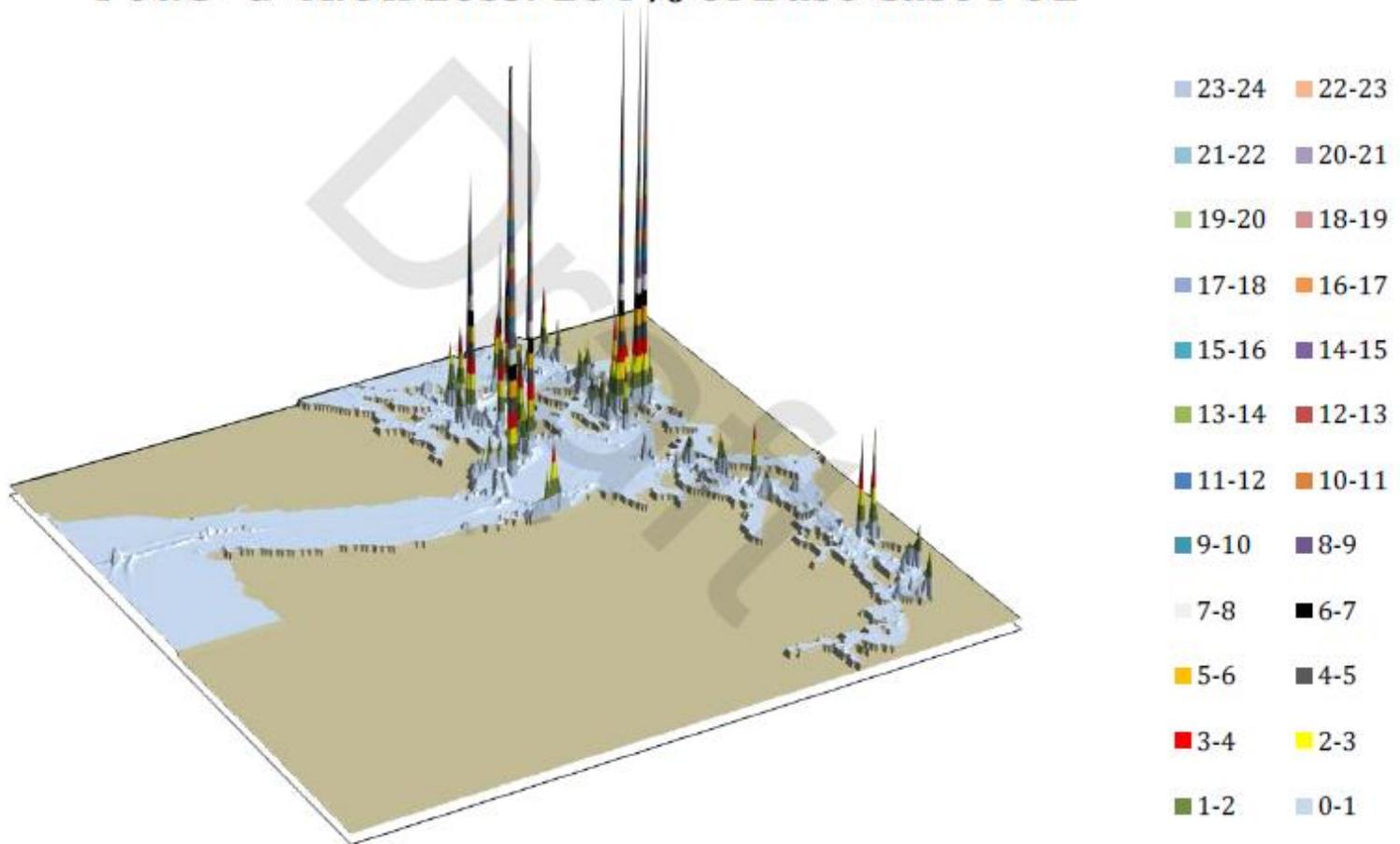
## VTRA 2015 Routes for What-If Case: USKMCA1600

	VTRA 2015
TOTAL WHATIF - CA PROJECTS (without Bunkering)	1020
TOTAL WHATIF - KM (without Bunkering)	348
TOTAL WHATIF - US PROJECTS (without Bunkering)	232
SUBTOTAL WHAT-IF (without Bunkering)	1600
TOTAL BUNKERING SUPPORT - CA PROJECTS	111
TOTAL BUNKERING SUPPORT - KM	17
TOTAL BUNKERING SUPPORT - US PROJECTS	49
SUBTOTAL Bunkering Support	177
TOTAL WHAT-IF FOCUS VESSELS	1777

## VTRA '15: Base Case 3D Risk Profile All FV - Pot.C+G+A.Oil Loss: 100% of Base Case POL

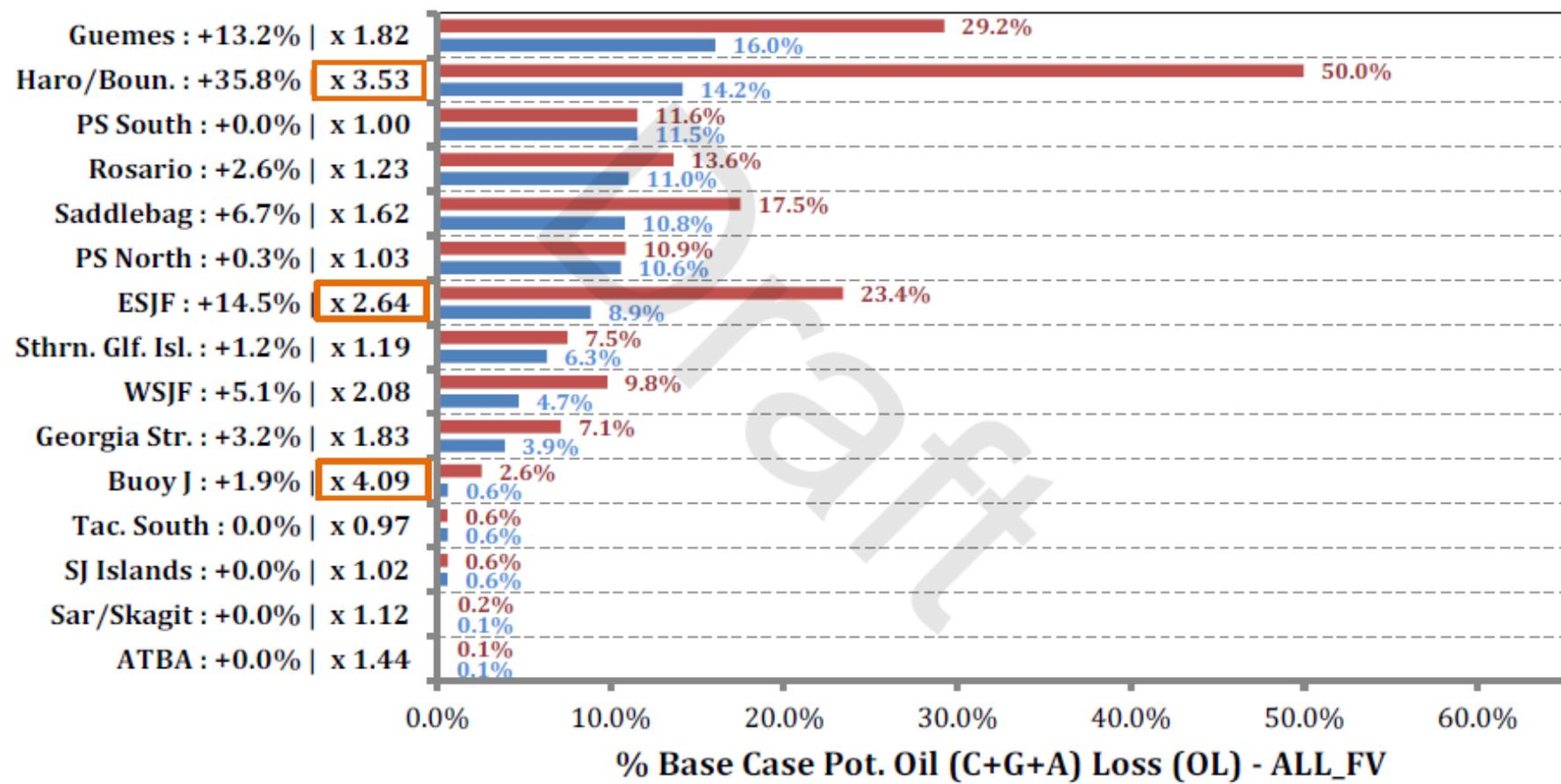


## US - KM - CA - 1598 3D Risk Profile All FV - Pot.C+G+A.Oil Loss: 184% of Base Case POL



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2015

## % Base Case Pot. Oil (C + G + A) Loss - ALL\_FV



■ US - KM - CA - 1598 : 185% ( +84.7% | x 1.85)    ■ VTRA '15: Base Case : 100%

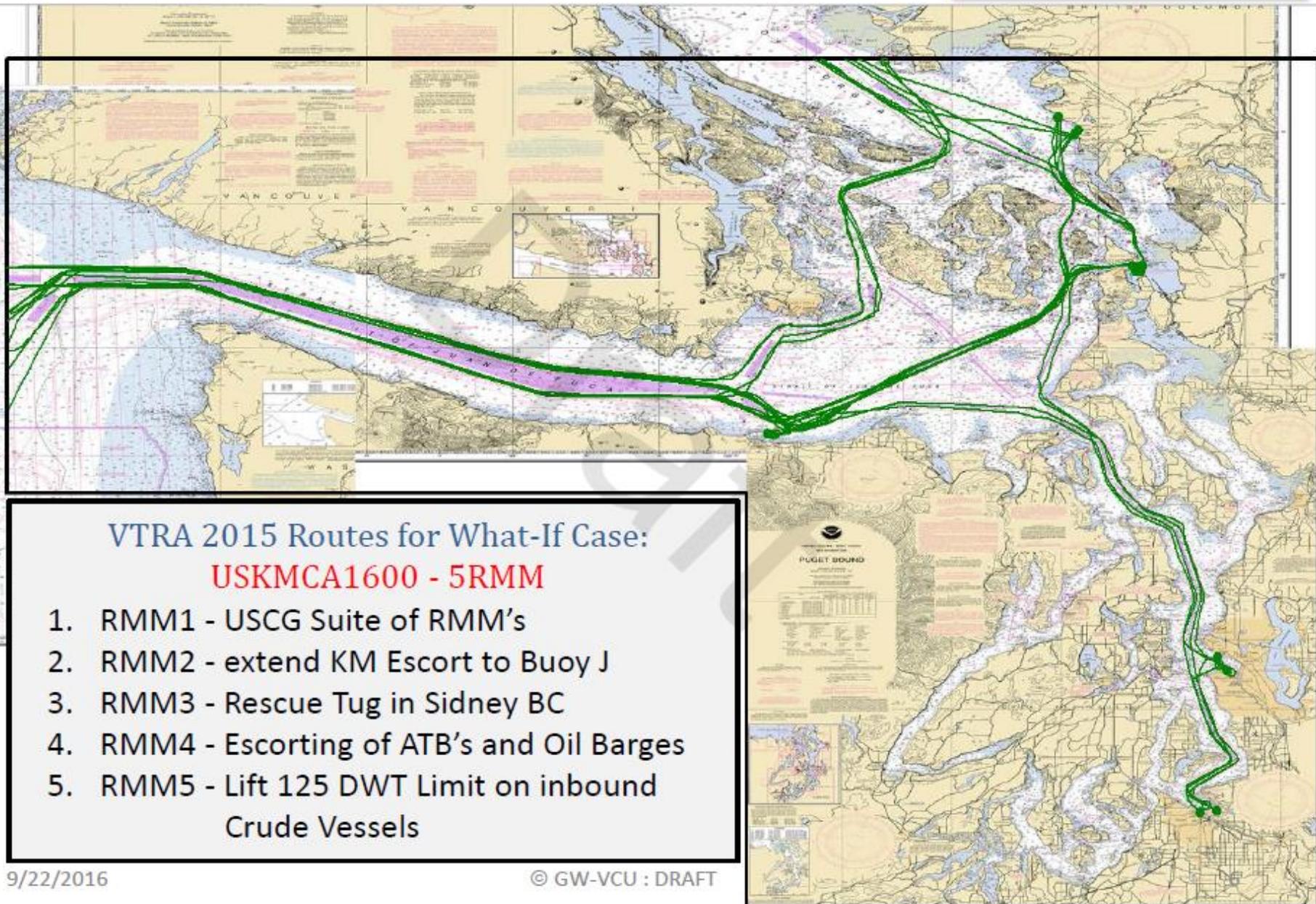
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# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2015



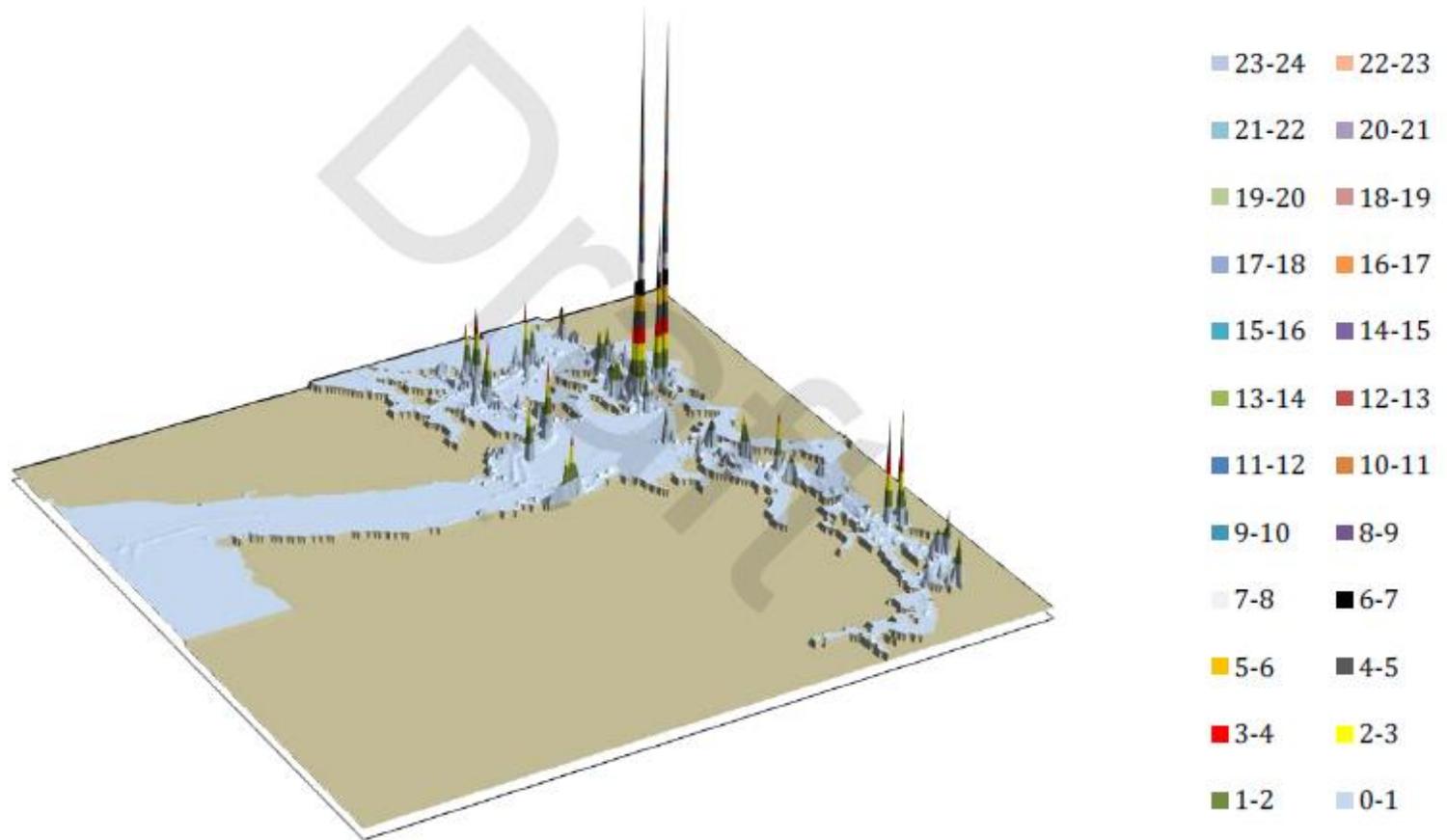
## RMM1 – USCG Suite of RMM's

- 1. 100% Double Hull Fuel Protection for CARGO Focus Vessels**
  - + Two additional pending RMM's making following assumptions regarding **their potential effectiveness** on VTRA 2015 Model input parameters
- 2. 50% Reduction of Human Error and Mechanical Failure on Tugs in the , VTRA 2015 Model, excluding Oil Barges.**
- 3. Remove from VTRA 2015 Model the implemented Special Events i.e.: Whale Watching, Regatta's and Commercial and Tribal Fishing Openers**

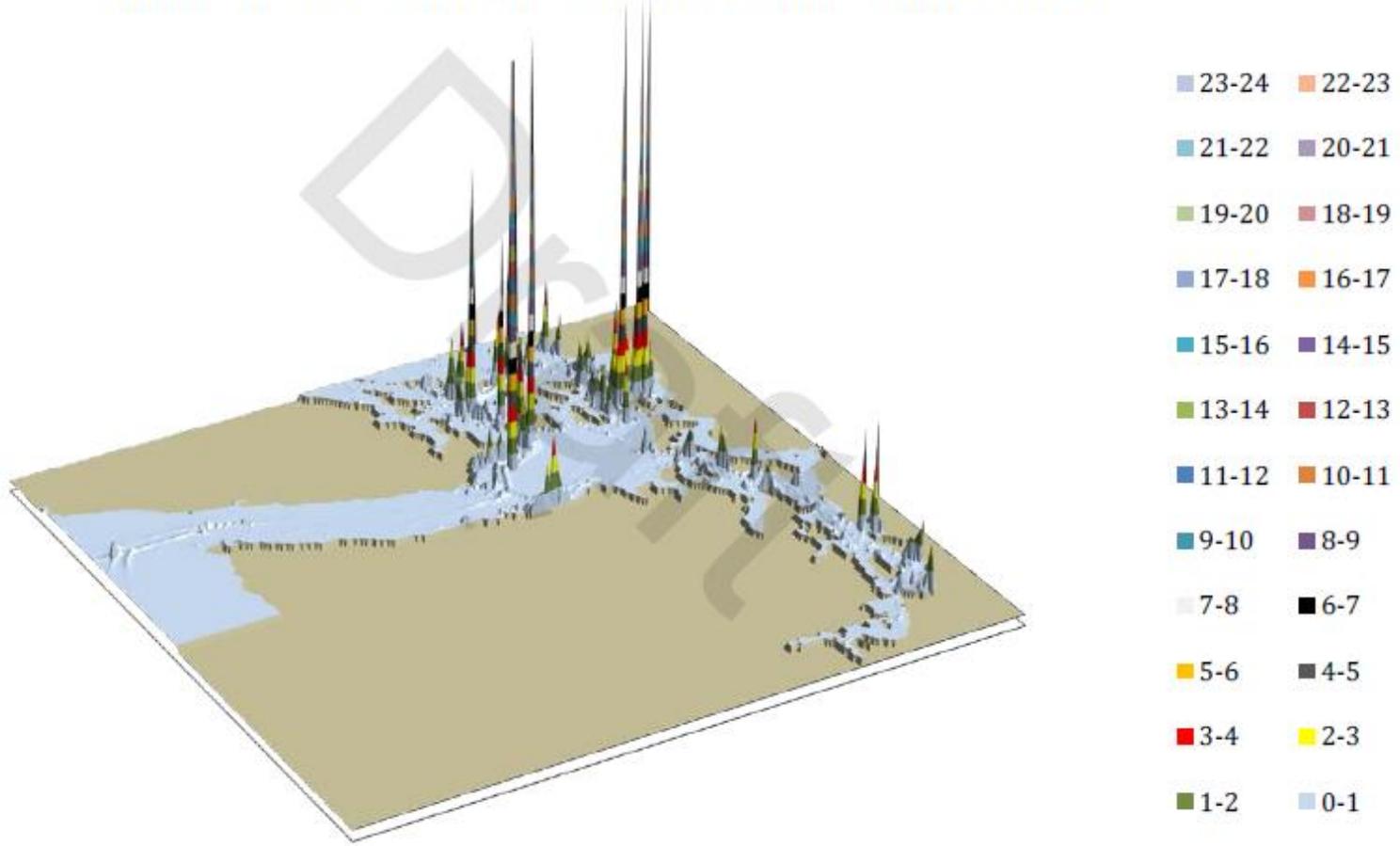
The effect of the last RMM in the VTRA 2015 Model analysis is two-fold, being:

- Exclude potential collisions of VTRA 2015 Focus Vessels with Special Event Vessels and
- Exclude the effect that Special Event Vessels may have on potential groundings of VTRA 2015 Focus Vessels.

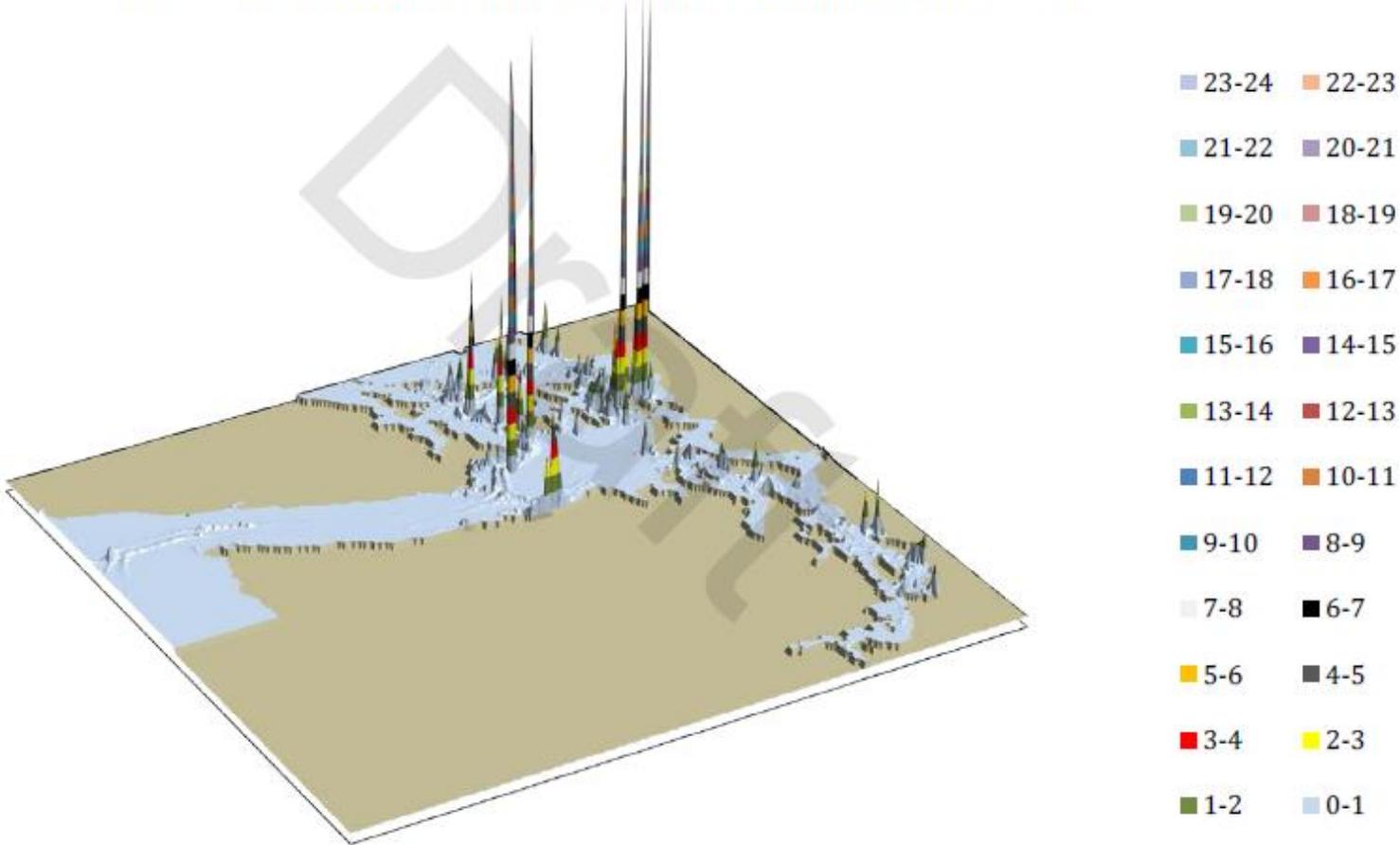
## VTRA '15: Base Case 3D Risk Profile All FV - Pot.C+G+A.Oil Loss: 100% of Base Case POL



## USKMCA1600 3D Risk Profile All FV - Pot.C+G+A.Oil Loss: 184% of Base Case POL



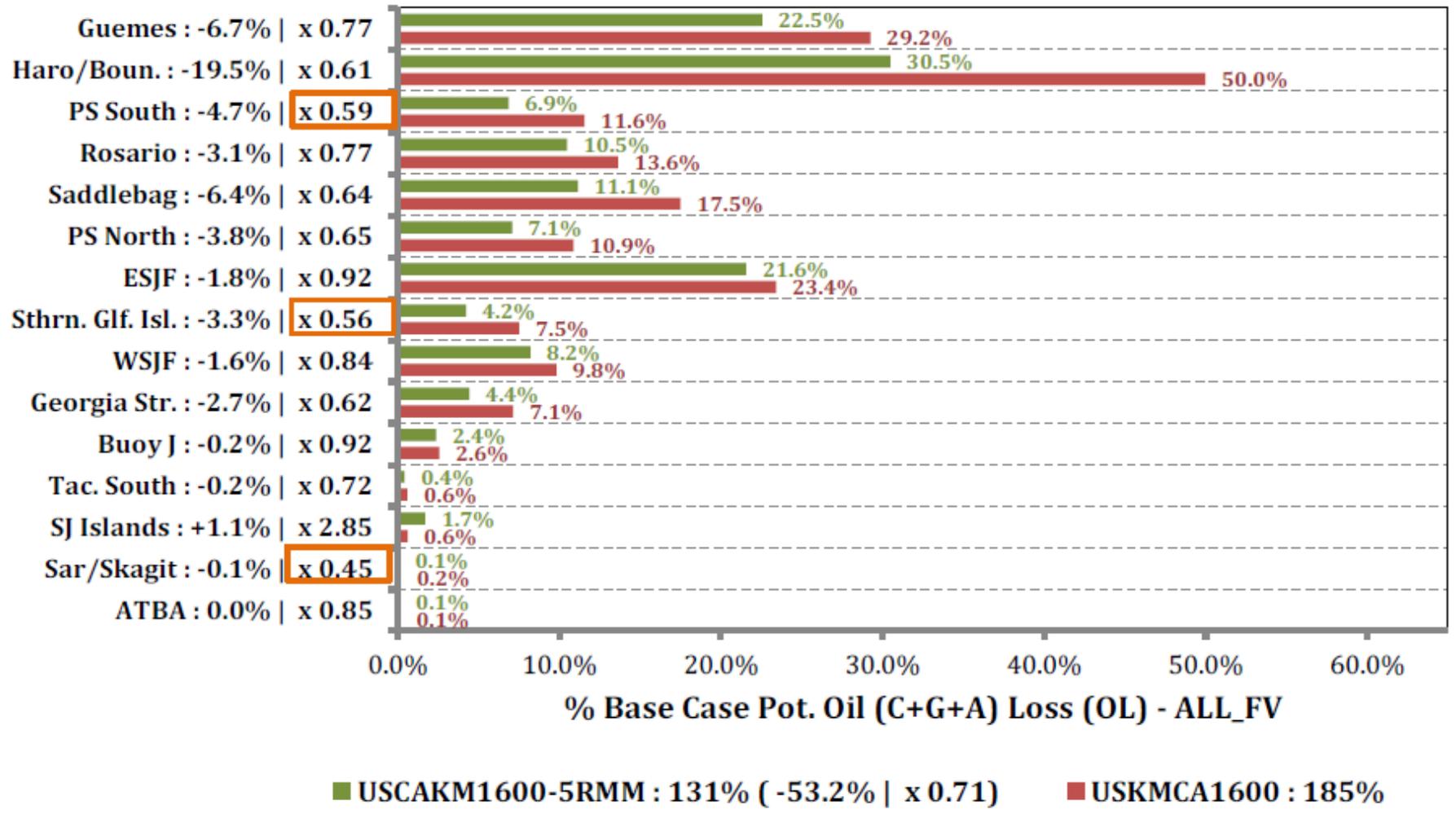
## USCAKM1600-5RMM 3D Risk Profile All FV - Pot.C+G+A.Oil Loss: 131% of Base Case POL



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2015



## % Base Case Pot. Oil (C + G + A) Loss - ALL\_FV



# Risk Mitigation Measure Results

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<b>RMM</b>	<b>Change in Base Case POL</b>	<b>Change in Base Case PAF</b>
<b>5RMM Portfolio</b>	<b>-53.2%</b>	<b>-26.6%</b>
<b>Escort Tankers to Buoy J</b>	<b>-0.1%</b>	<b>-</b>
<b>Rescue Tug in Sidney, BC</b>	<b>-1.2%</b>	<b>-0.1%</b>
<b>Escort Oil Barges and ATBs</b>	<b>-3.1%</b>	<b>-14.7%</b>
<b>Lift 125k DWT Restriction</b>	<b>+12.9%</b>	<b>-0.8%</b>

# Initial Thoughts

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- Caveat: GWU and VCU are drafting VTRA 2015 report, with detailed findings
- Initial review of results by Ecology suggests:
  - RMM 1, which attempts to model pending improvements to vessel safety and vessel traffic management, appears to produce most of the of the risk reduction of the 5RMM case
- How could the effects of RMM 1 be achieved? Potential topic for discussion at this workshop, and further investigation once the 2015 VTRA final report is available
- Effects of RMMs 2 through 5 should continue to be examined

# Next Steps

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- GWU, VCU draft VTRA 2015 report
- Ecology and workgroup review report
- Ecology produce focus sheet to provide context for results
- Based on final report, use results to continue our spill prevention work
- Report will be available on Ecology and GWU websites by end of 2016

# Questions?

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