

VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

3D Relative Risk Profile Comparison
Potential Collision Oil Loss

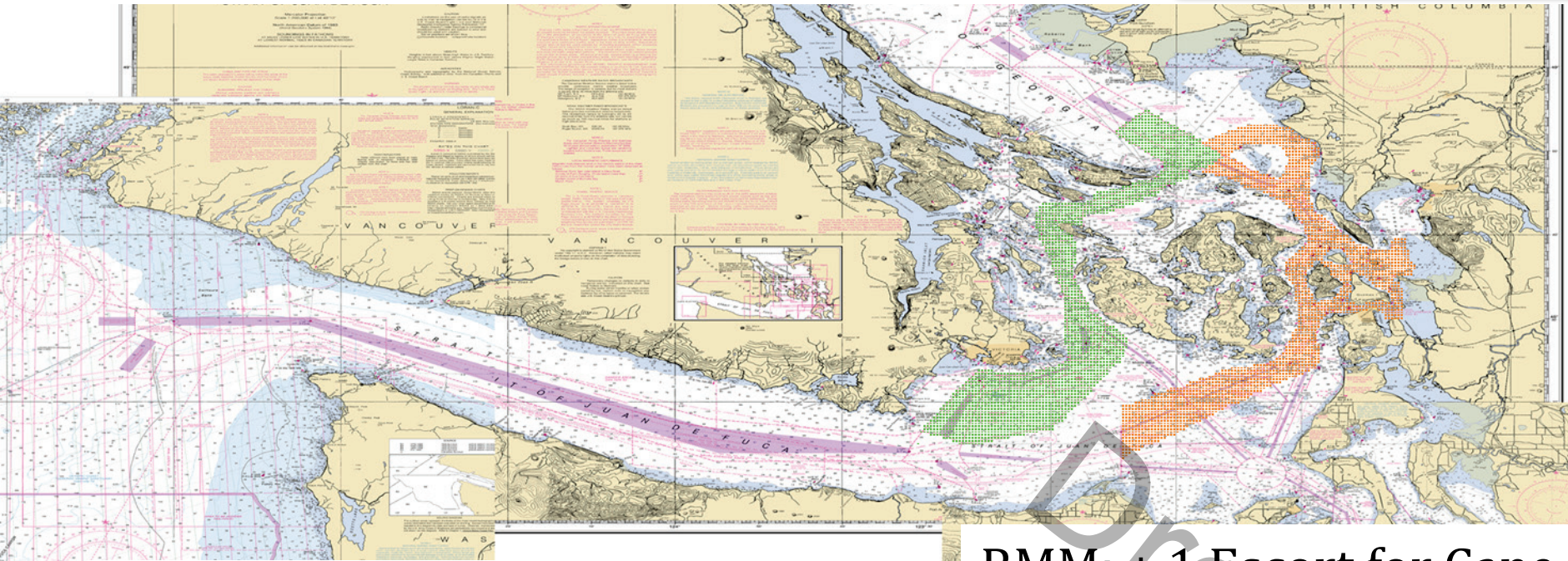
CASE T: GW – KM – DP & +1 Escort Cape Size

Dr. J. Rene van Dorp and Dr. Jason R.W Merrick

November 2013



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

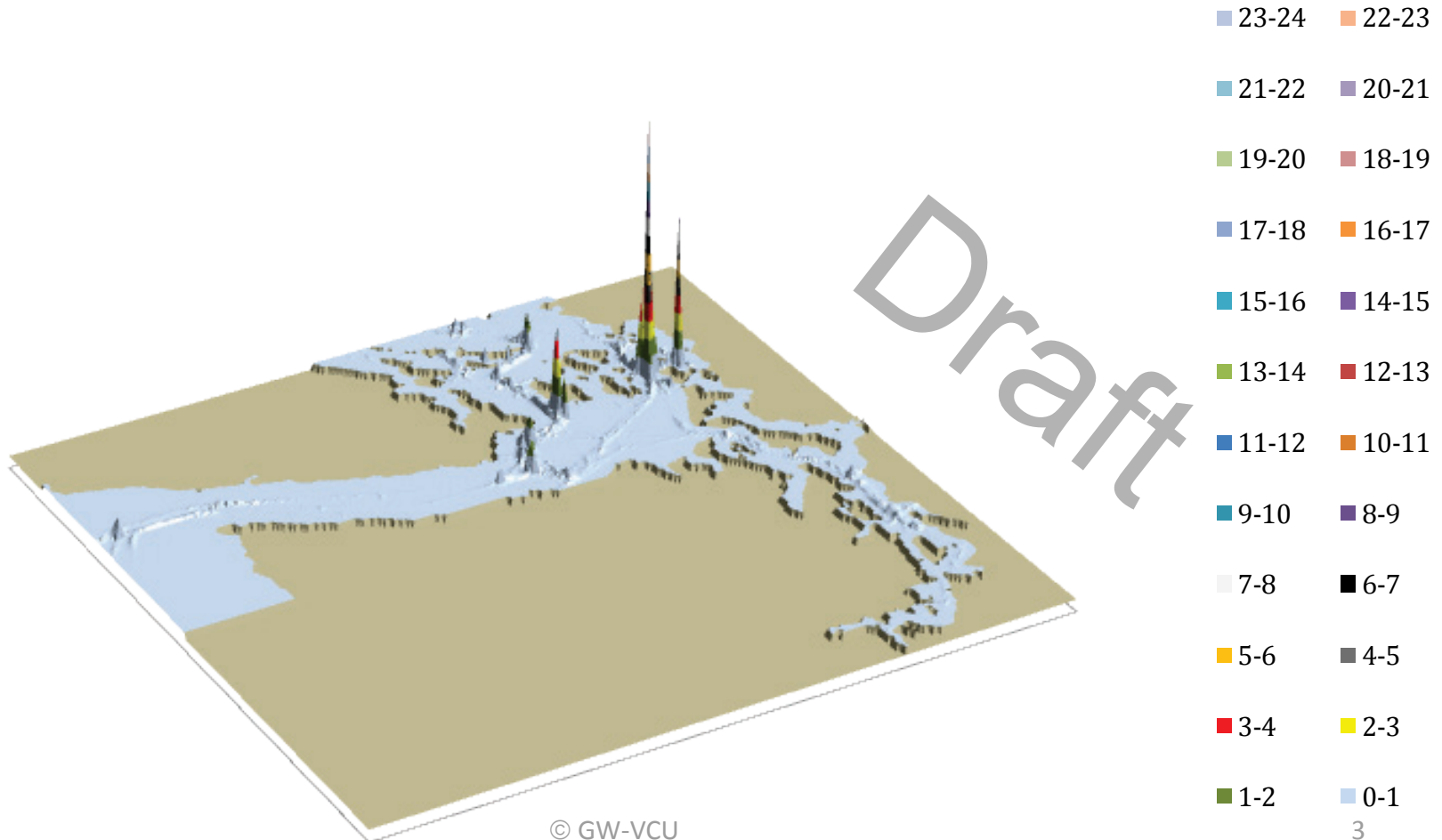


**DEFINITION OF ASSUMED LOCATIONS
FOR ADDED ESCORT VESSEL
FOR HARO-BOUNDARY ROUTES (GREEN)
AND
FOR ROSARIO ROUTES (ORANGE)**

RMM: + 1 Escort for Cape
Size Bulk Carriers on
Rosario Routes (Orange)
and
Haro – Boundary Pass
Routes (Green)

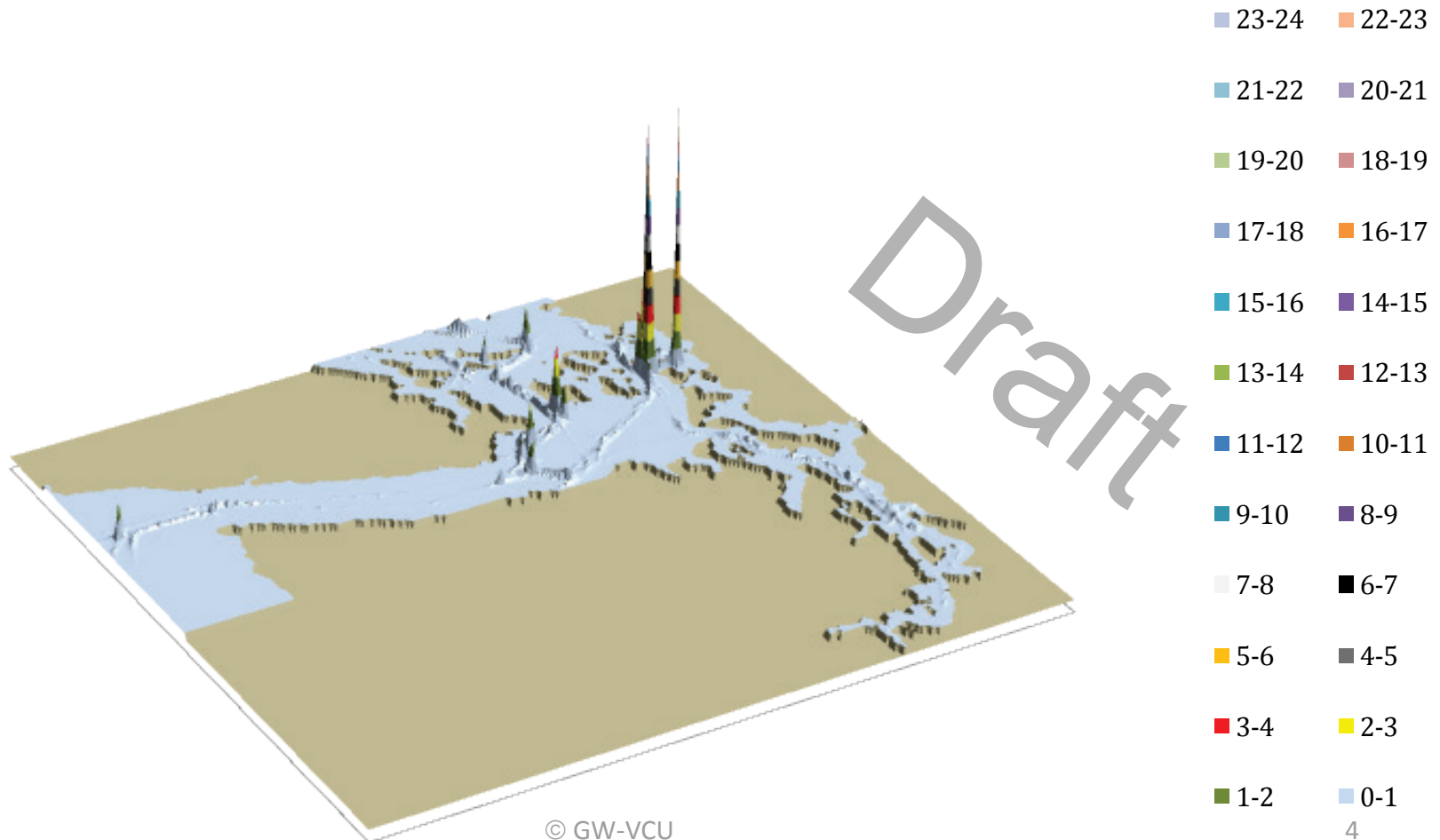
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP 3D Risk Profile All FV - Pot. Collision Oil Loss: 189% of Base Case PCO



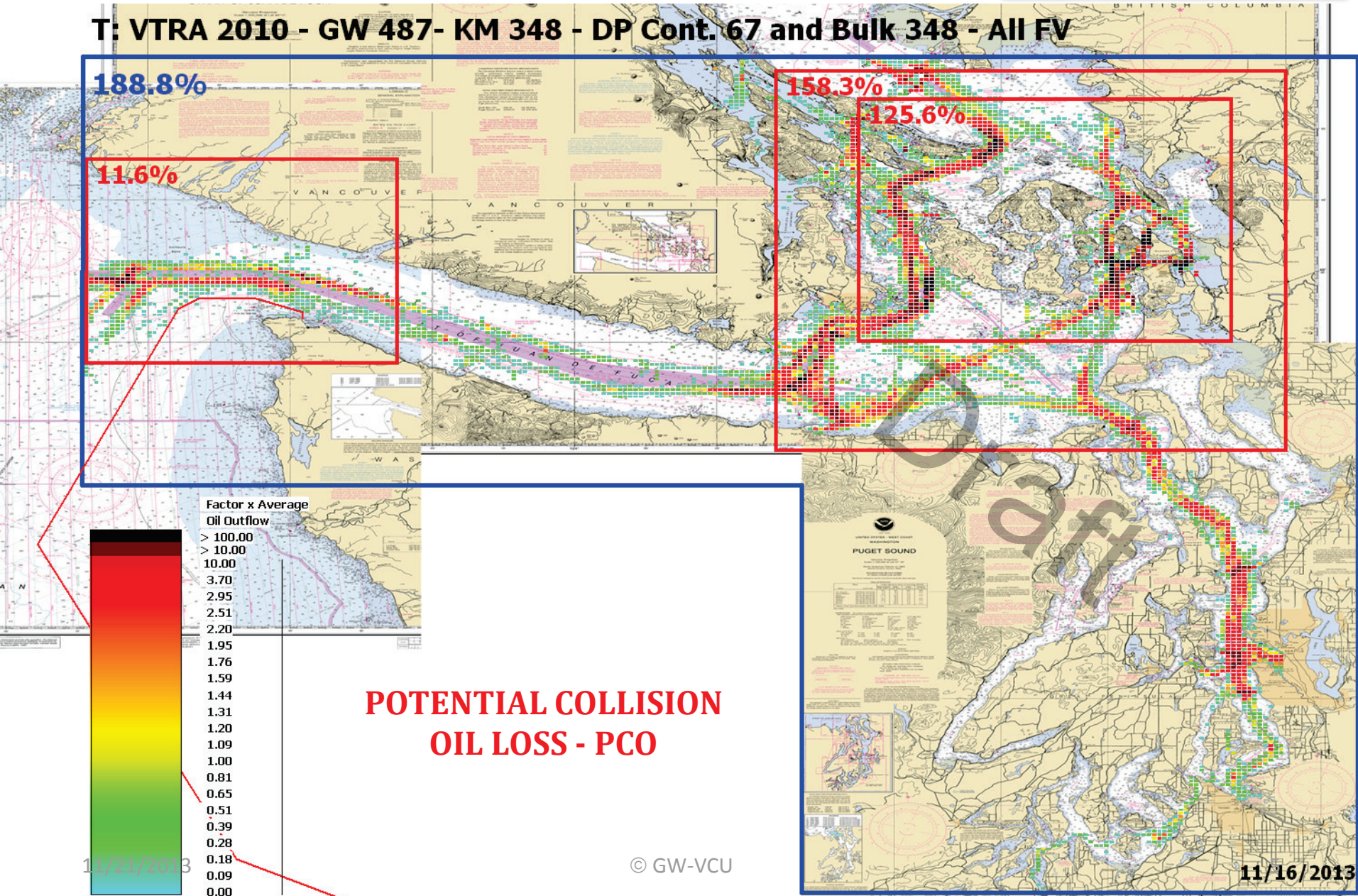
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP & EC 3D Risk Profile All FV - Pot. Collision Oil Loss: 185% of Base Case PCO



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW 487- KM 348 - DP Cont. 67 and Bulk 348 - All FV



POTENTIAL COLLISION OIL LOSS - PCO

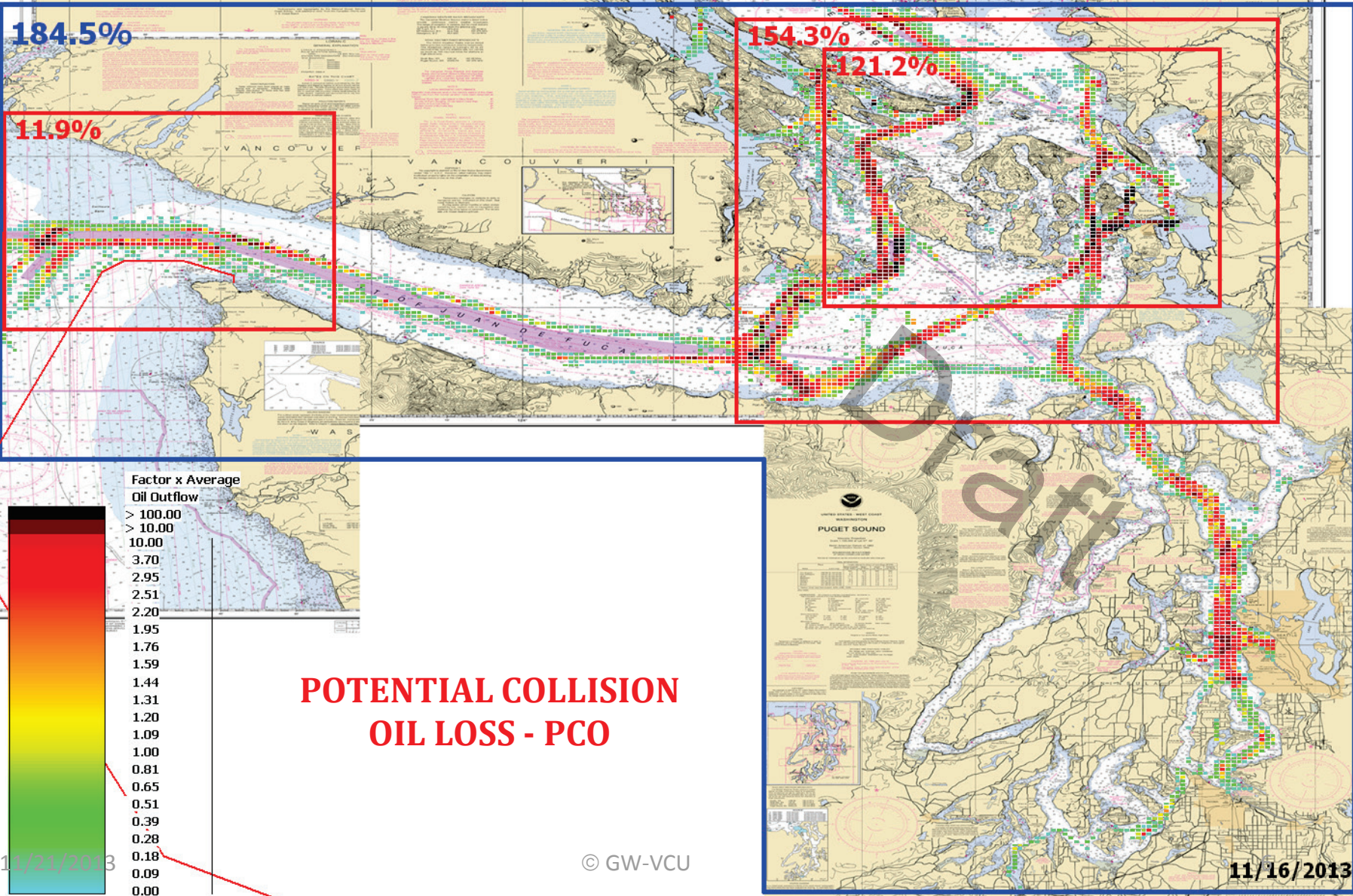
11/21/2013

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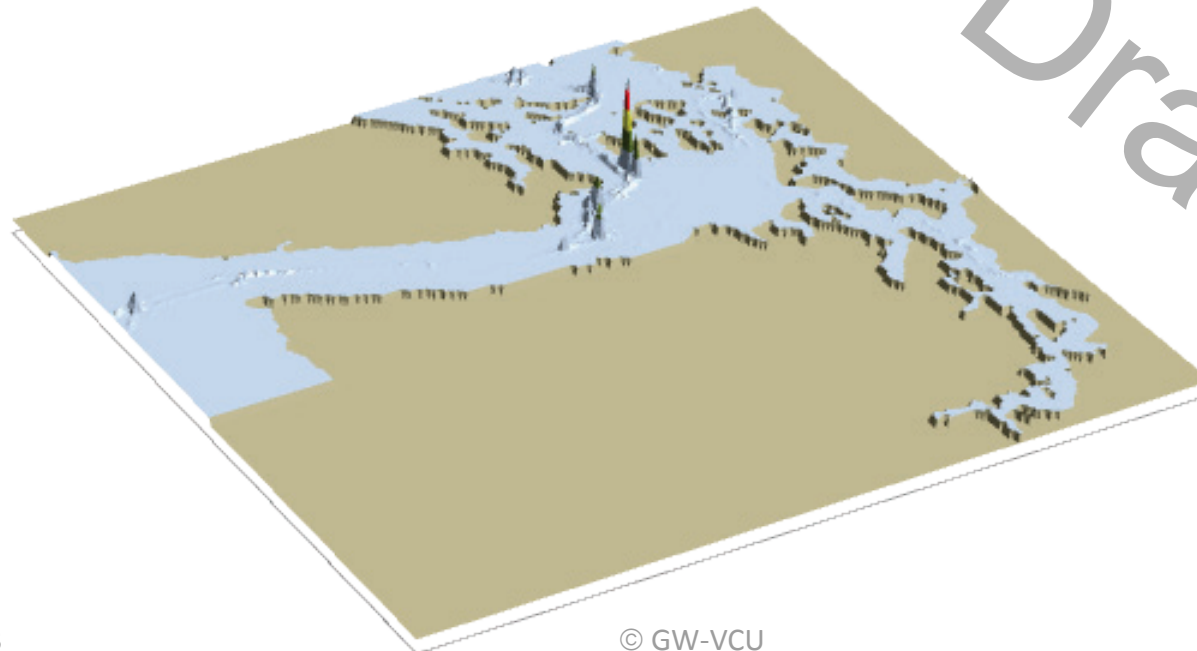
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 GW - KM - DP & + 1 Escort Cape Class Bulklers - All FV



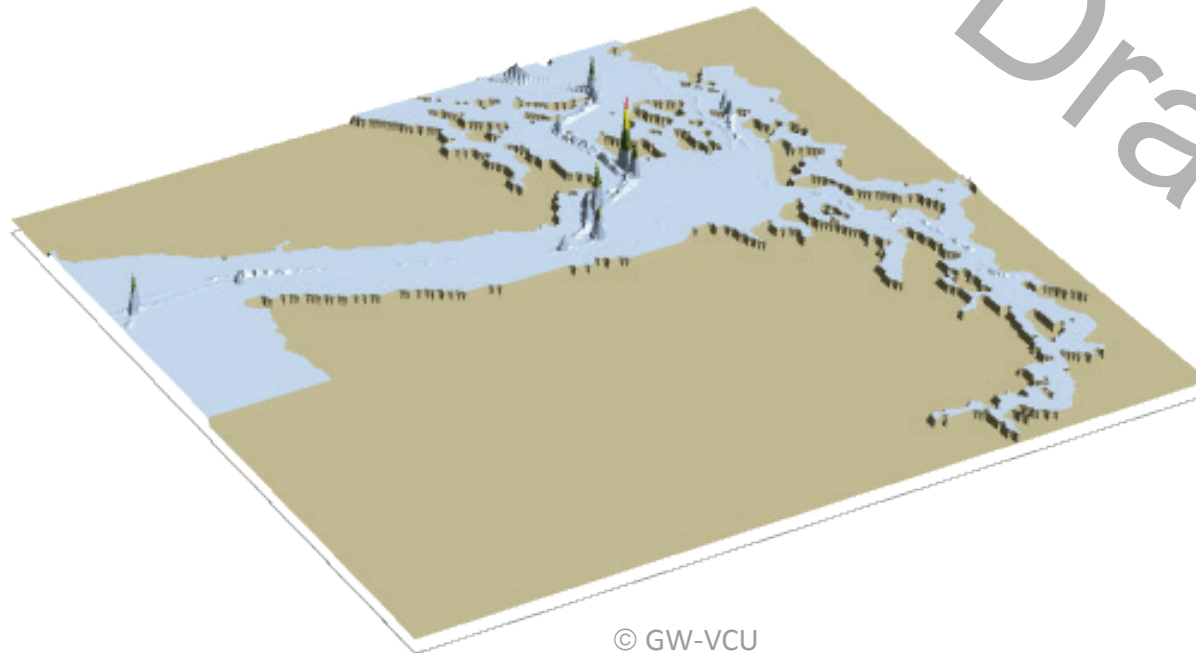
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP 3D Risk Profile What If FV - Pot. Coll. Oil Loss: 62% of Base Case PCO



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

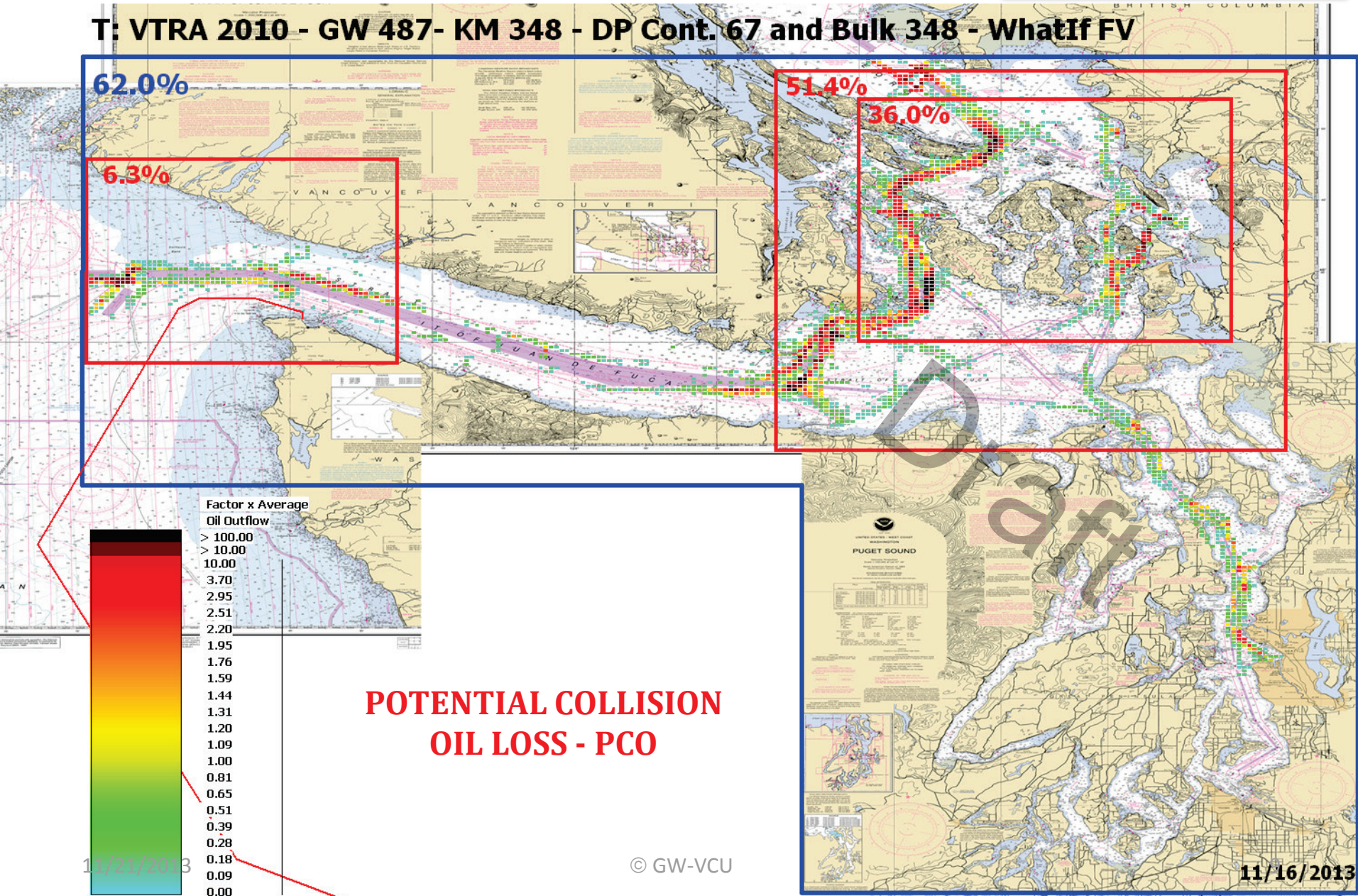
T: GW - KM - DP & EC 3D Risk Profile What If FV - Pot. Coll. Oil Loss: 58% of Base Case PCO



- | | |
|---------|---------|
| ■ 23-24 | ■ 22-23 |
| ■ 21-22 | ■ 20-21 |
| ■ 19-20 | ■ 18-19 |
| ■ 17-18 | ■ 16-17 |
| ■ 15-16 | ■ 14-15 |
| ■ 13-14 | ■ 12-13 |
| ■ 11-12 | ■ 10-11 |
| ■ 9-10 | ■ 8-9 |
| ■ 7-8 | ■ 6-7 |
| ■ 5-6 | ■ 4-5 |
| ■ 3-4 | ■ 2-3 |
| ■ 1-2 | ■ 0-1 |

VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW 487- KM 348 - DP Cont. 67 and Bulk 348 - WhatIf FV



POTENTIAL COLLISION OIL LOSS - PCO

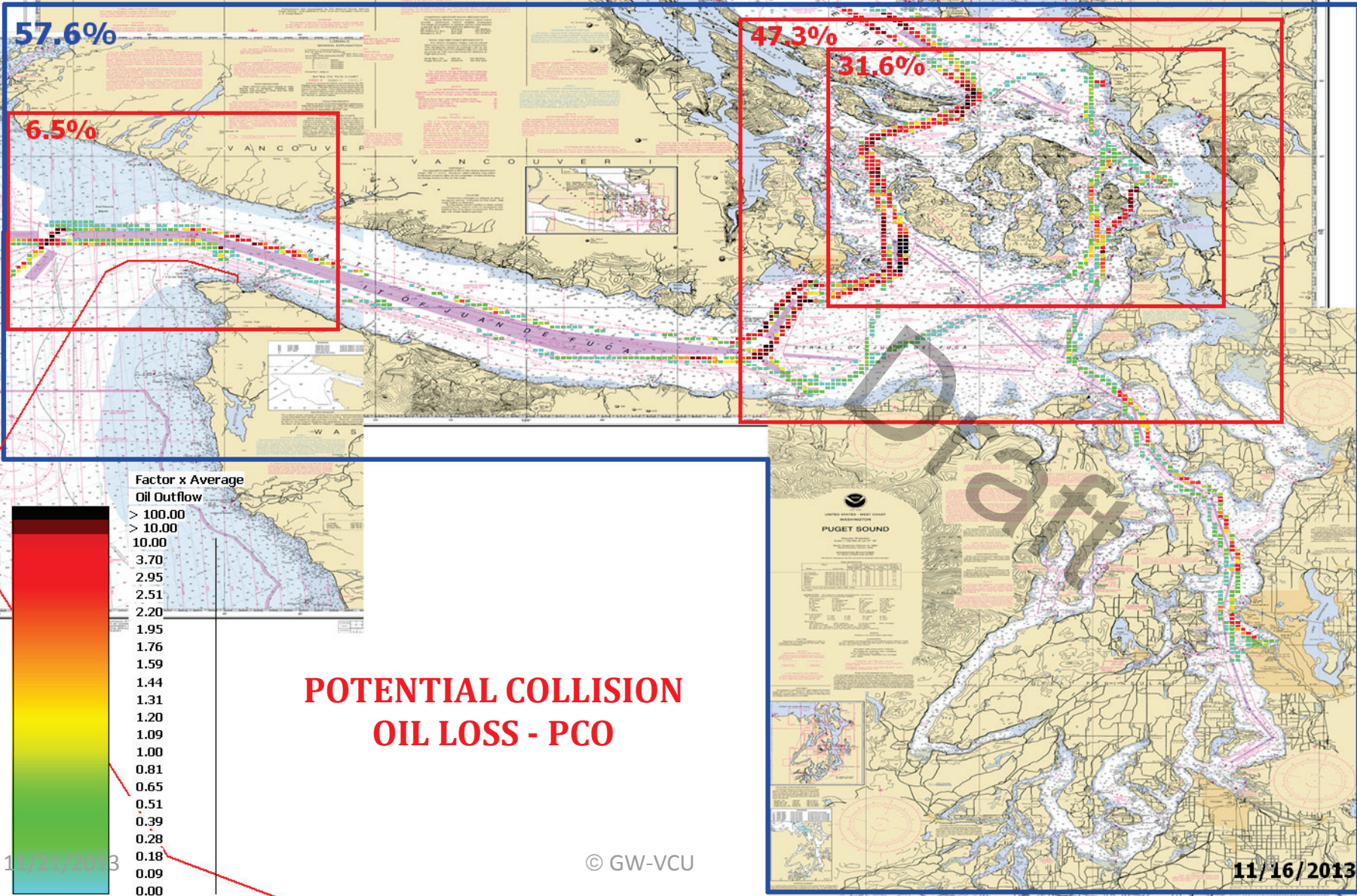
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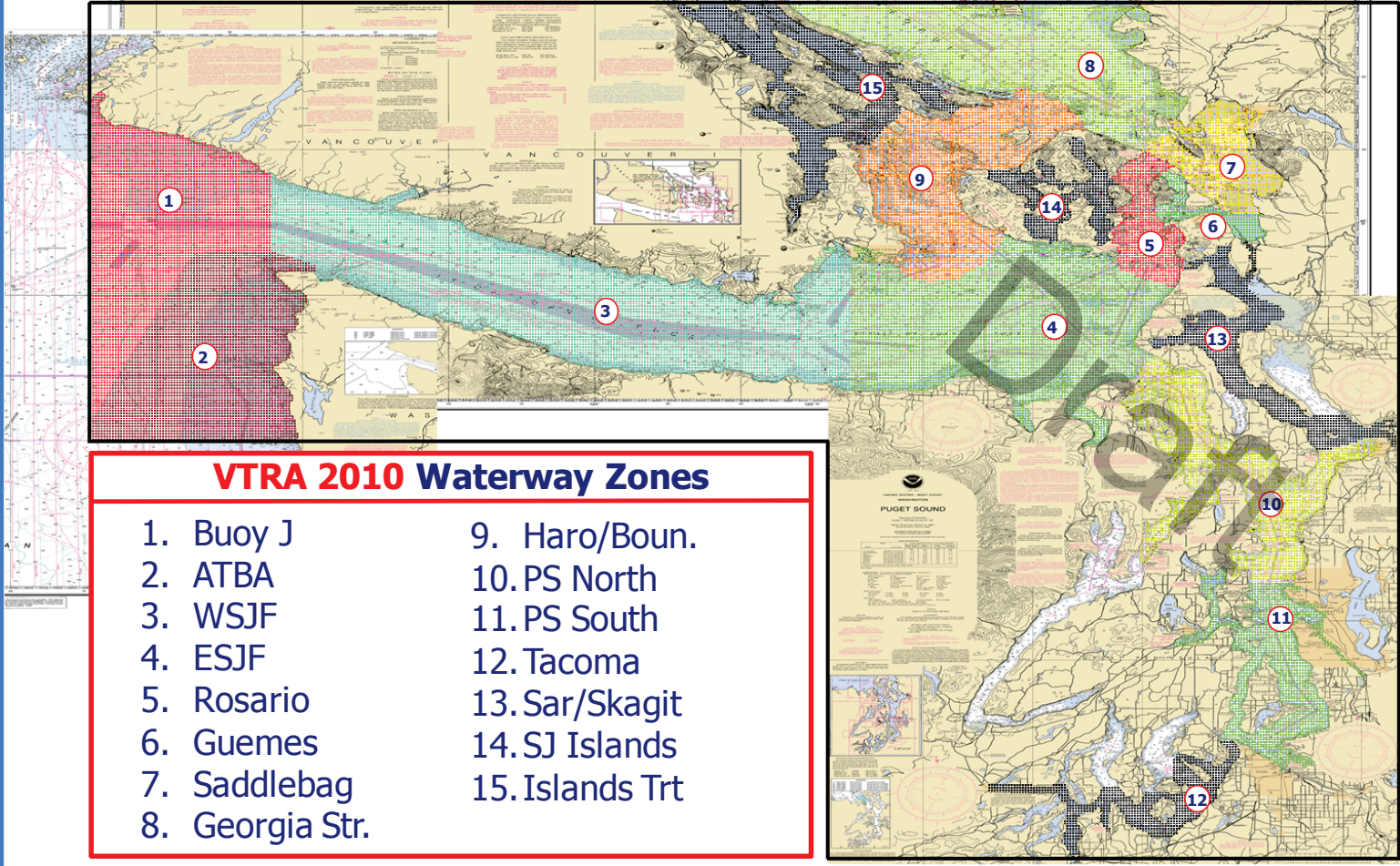
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 GW - KM - DP & + 1 Escort Cape Class Bulklers - WhatIf FV



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

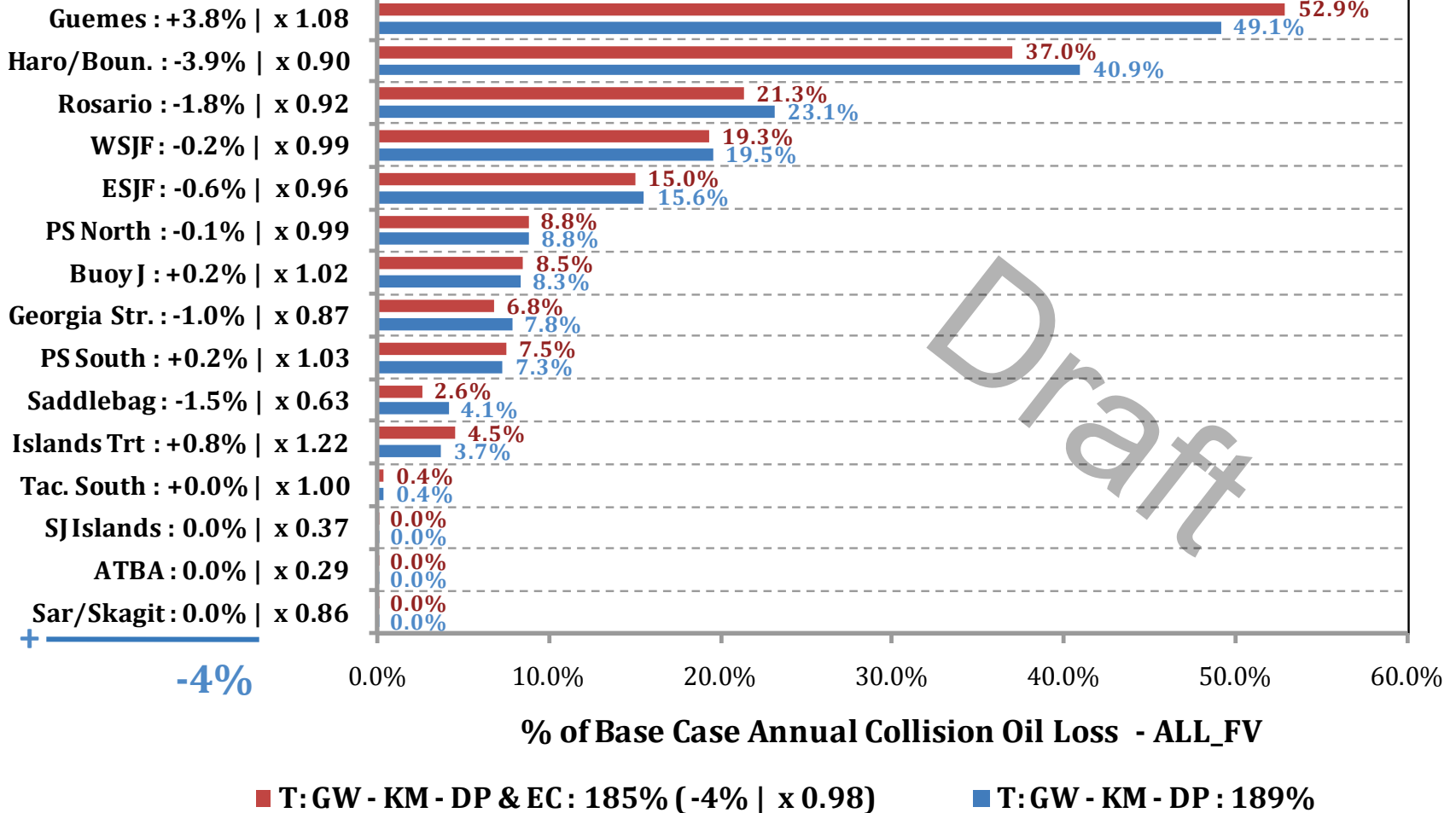
DEFINITION OF 15 WATERWAY ZONES



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

% Base Case Collision Oil Loss - ALL_FV

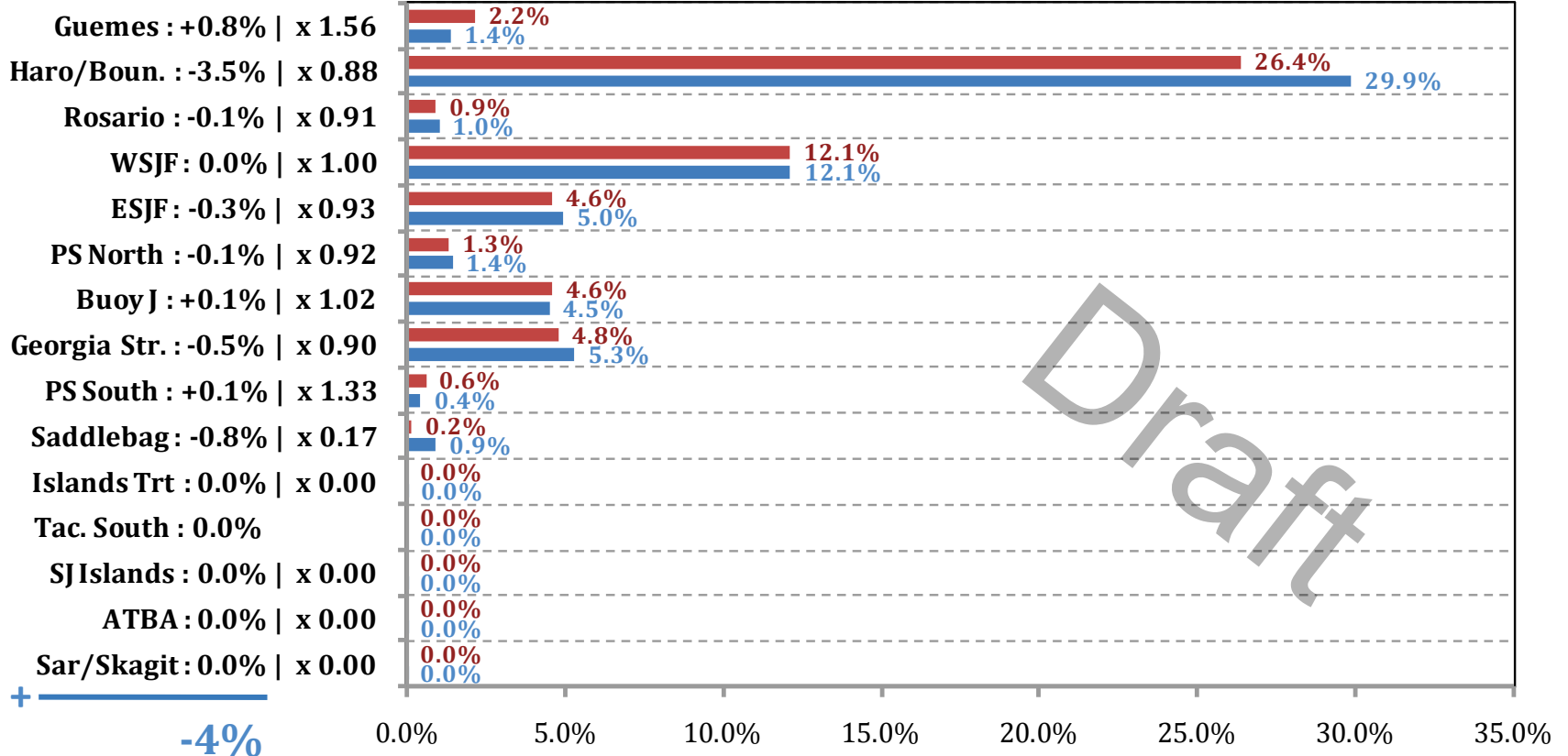
Waterway Zone:



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

% Base Case Collision Oil Loss - WhatIf

Waterway Zone:



% of Base Case Annual Collision Oil Loss - WhatIf

■ T:GW - KM - DP & EC : 58% (-4% | x 0.93)

■ T:GW - KM - DP : 62%