

VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

3D Relative Risk Profile Comparison
Oil Time Exposure

CASE T – GW – KM – DP & 6 RMM's

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VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010



RMM 1: Max. Speed of Container Vessels at 17 knots.

RMM 2: Reduce Human Error incident on Oil Barges by 50%

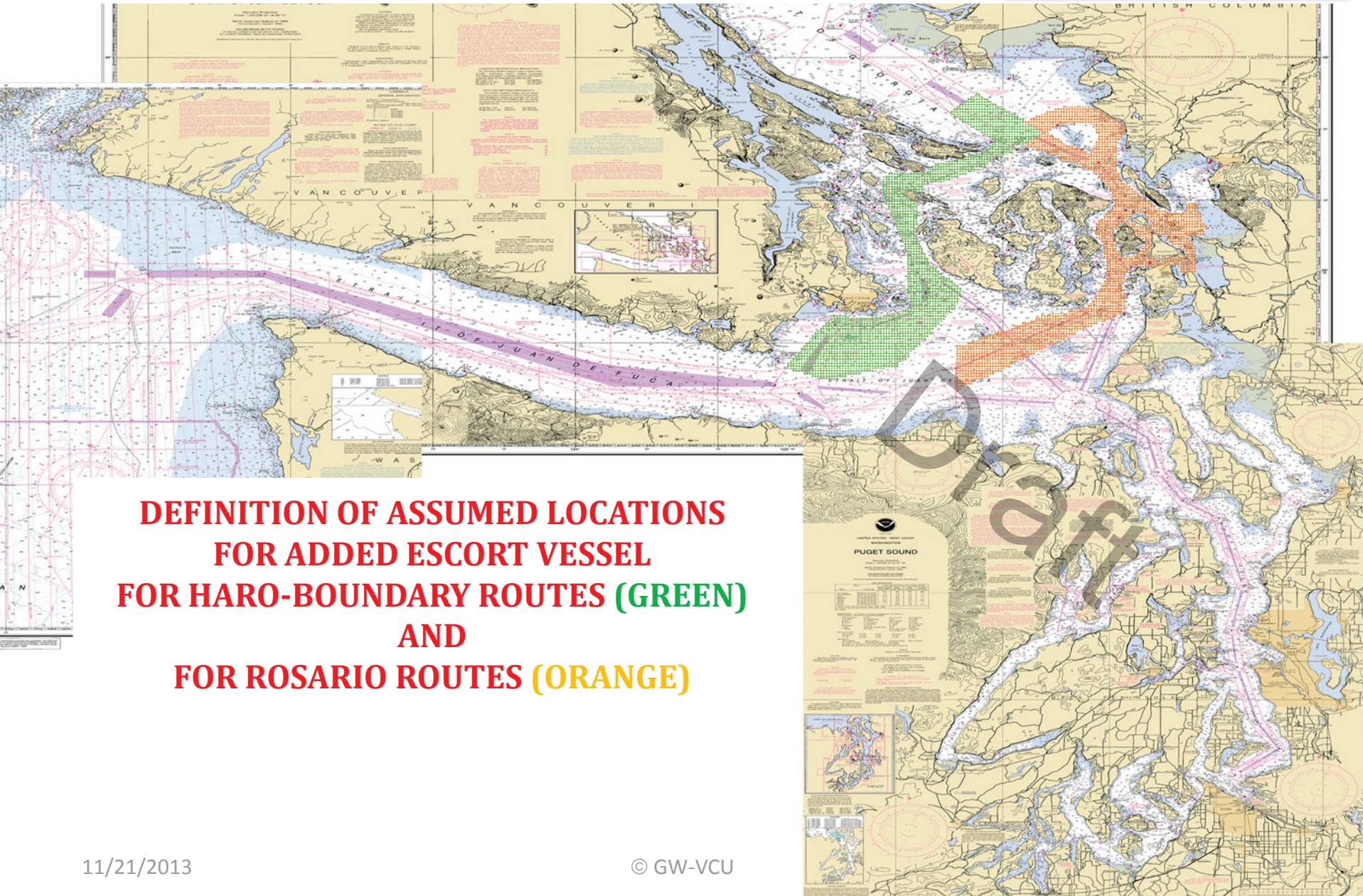
RMM 3: No Bunkering for Gateway Vessels

RMM 4: ATB Vessels obey Rosario one-way regime

RMM 5: + 1 Escort for Laden Tank Focus Vessels (except Oil Barges) and Cape size Bulk Carriers on Rosario Routes (see next page)

RMM 6: + 1 Escort for All Focus Vessels on Haro-Boundary Pass Routes (see next page)

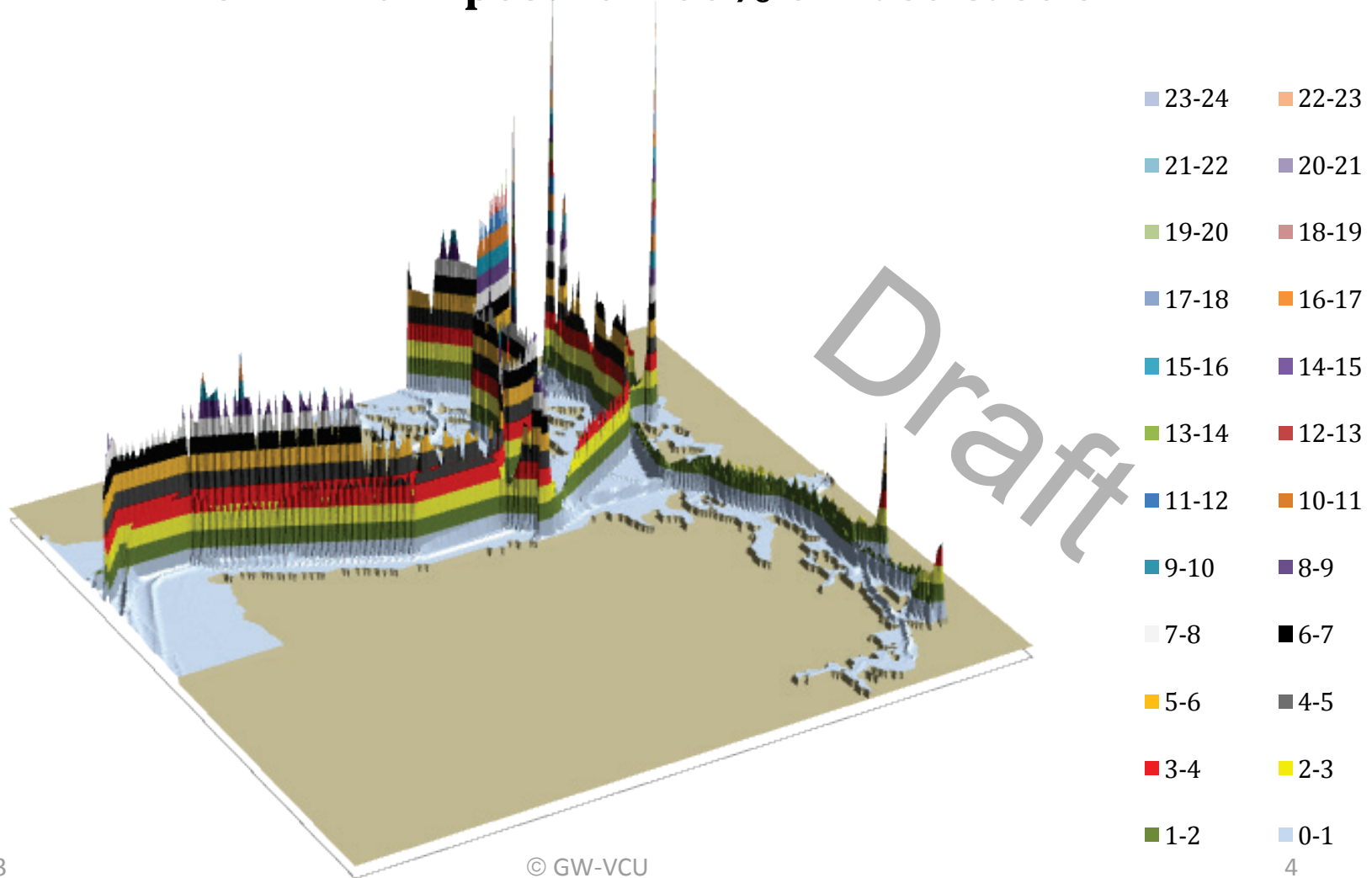
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010



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

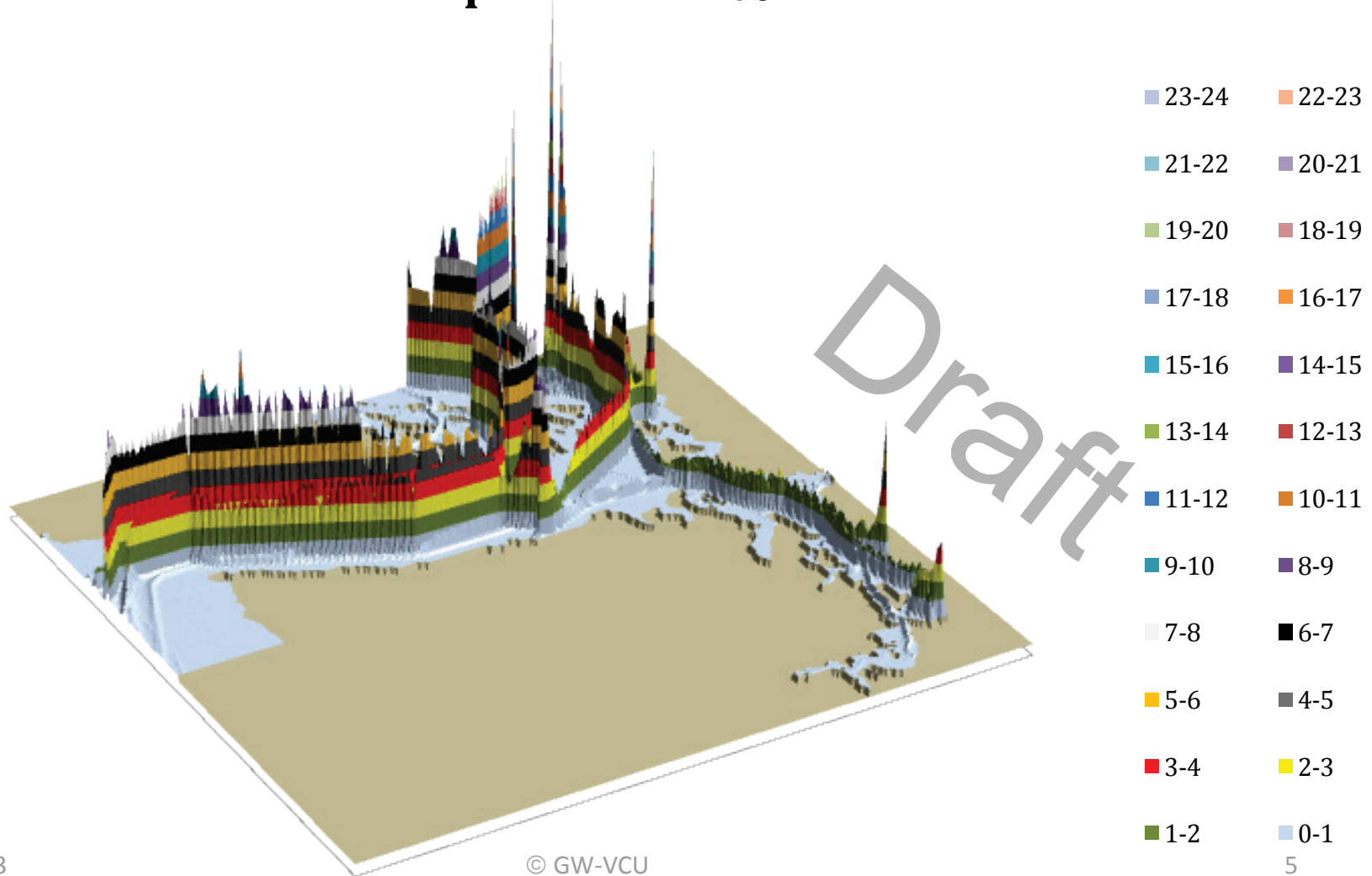
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP 3D Risk Profile All FV - Oil Time Exposure: 160% of Base Case OTE



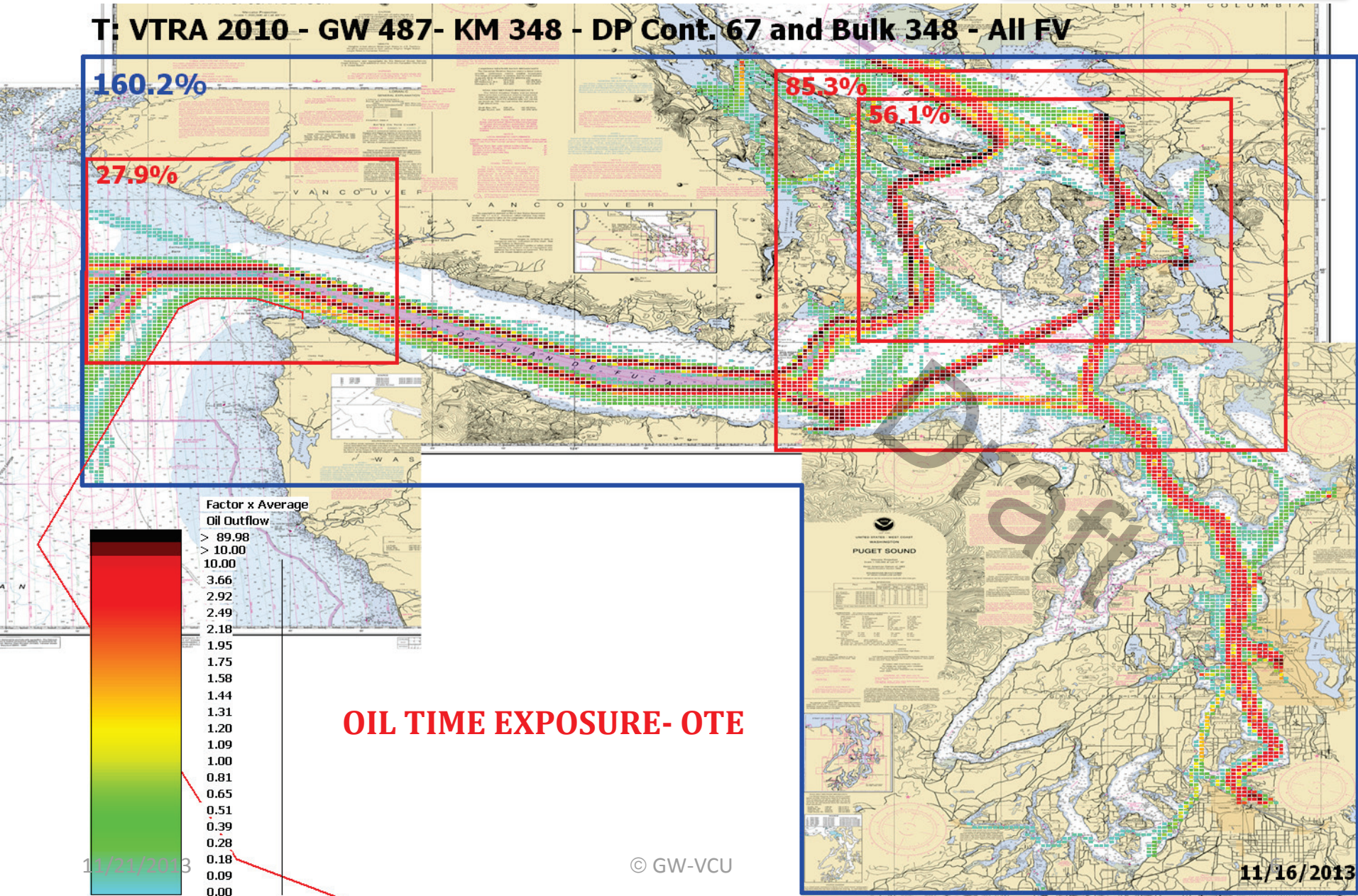
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP & 6 RMM 3D Risk Profile All FV - Oil Time Exposure: 163% of Base Case OTE



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

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



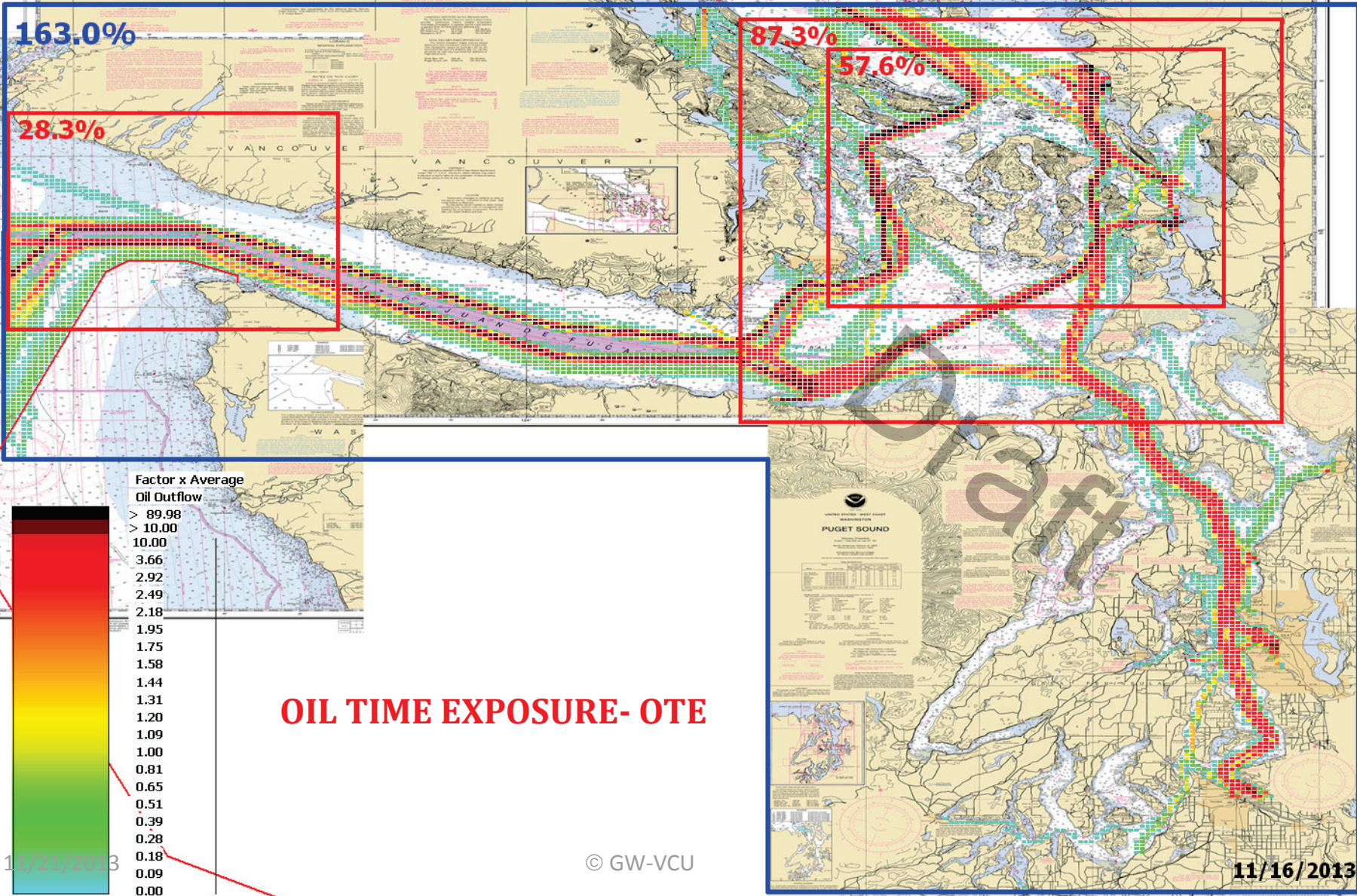
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VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW - KM - DP & 6 RMM's - All FV



- Factor x Average Oil Outflow
- > 89.98
 - > 10.00
 - 10.00
 - 3.66
 - 2.92
 - 2.49
 - 2.18
 - 1.95
 - 1.75
 - 1.58
 - 1.44
 - 1.31
 - 1.20
 - 1.09
 - 1.00
 - 0.81
 - 0.65
 - 0.51
 - 0.39
 - 0.28
 - 0.18
 - 0.09
 - 0.00

OIL TIME EXPOSURE- OTE

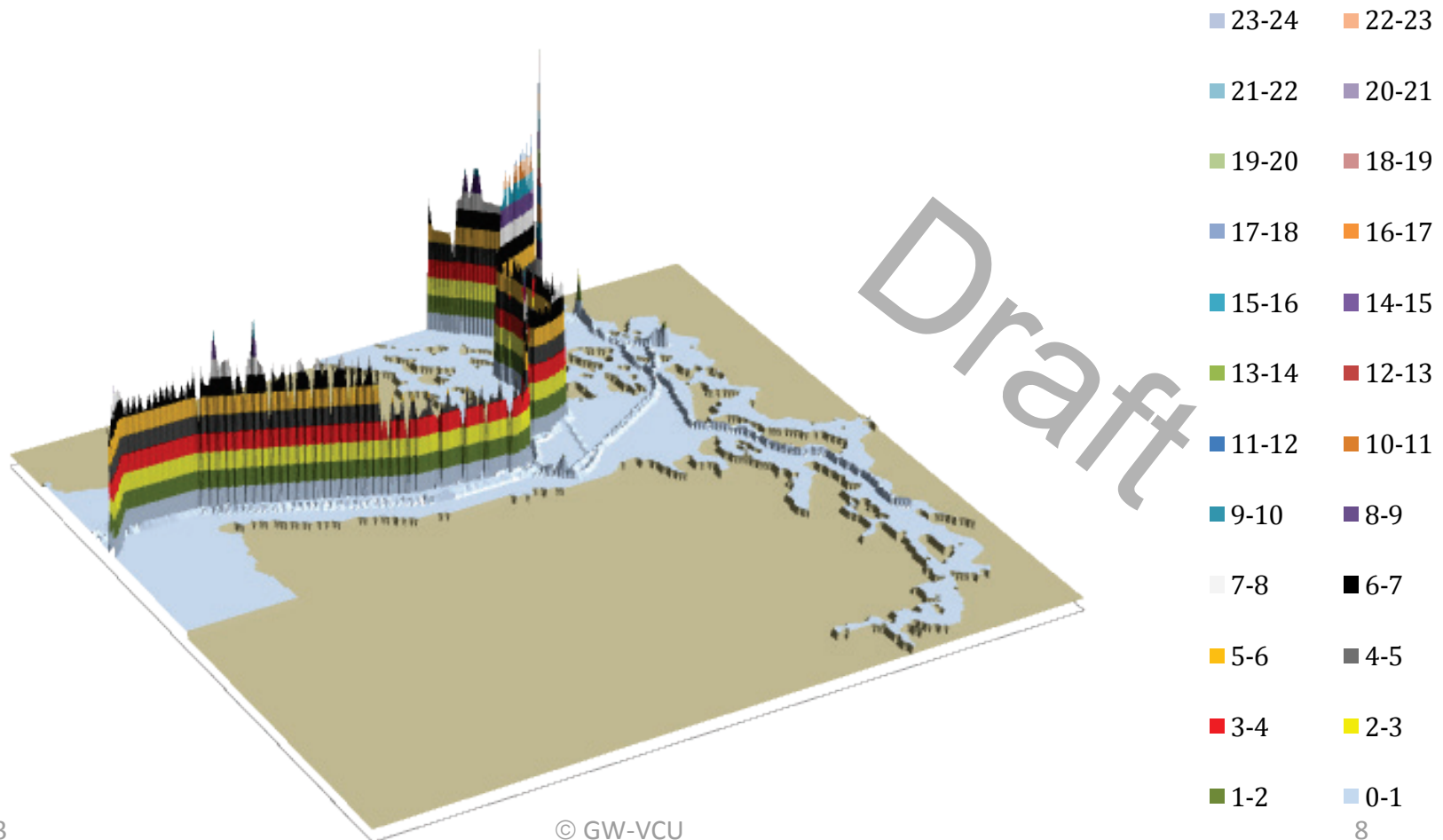
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VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP 3D Risk Profile What-If FV - Oil Time Exposure: 60% of Base Case OTE



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

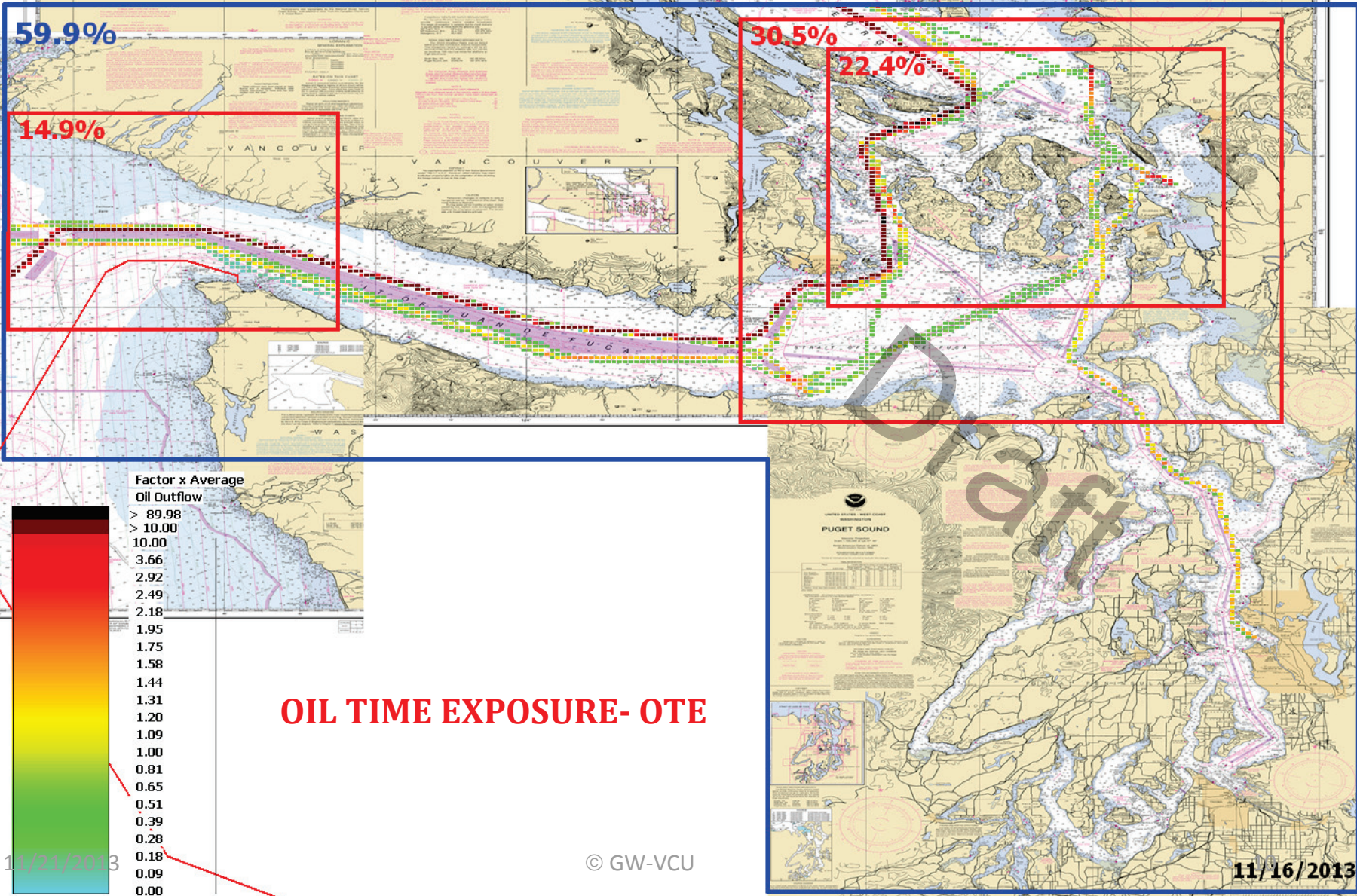


T: GW - KM - DP & 6 RMM 3D Risk Profile What-If FV - Oil Time Exposure: 59% of Base Case OTE



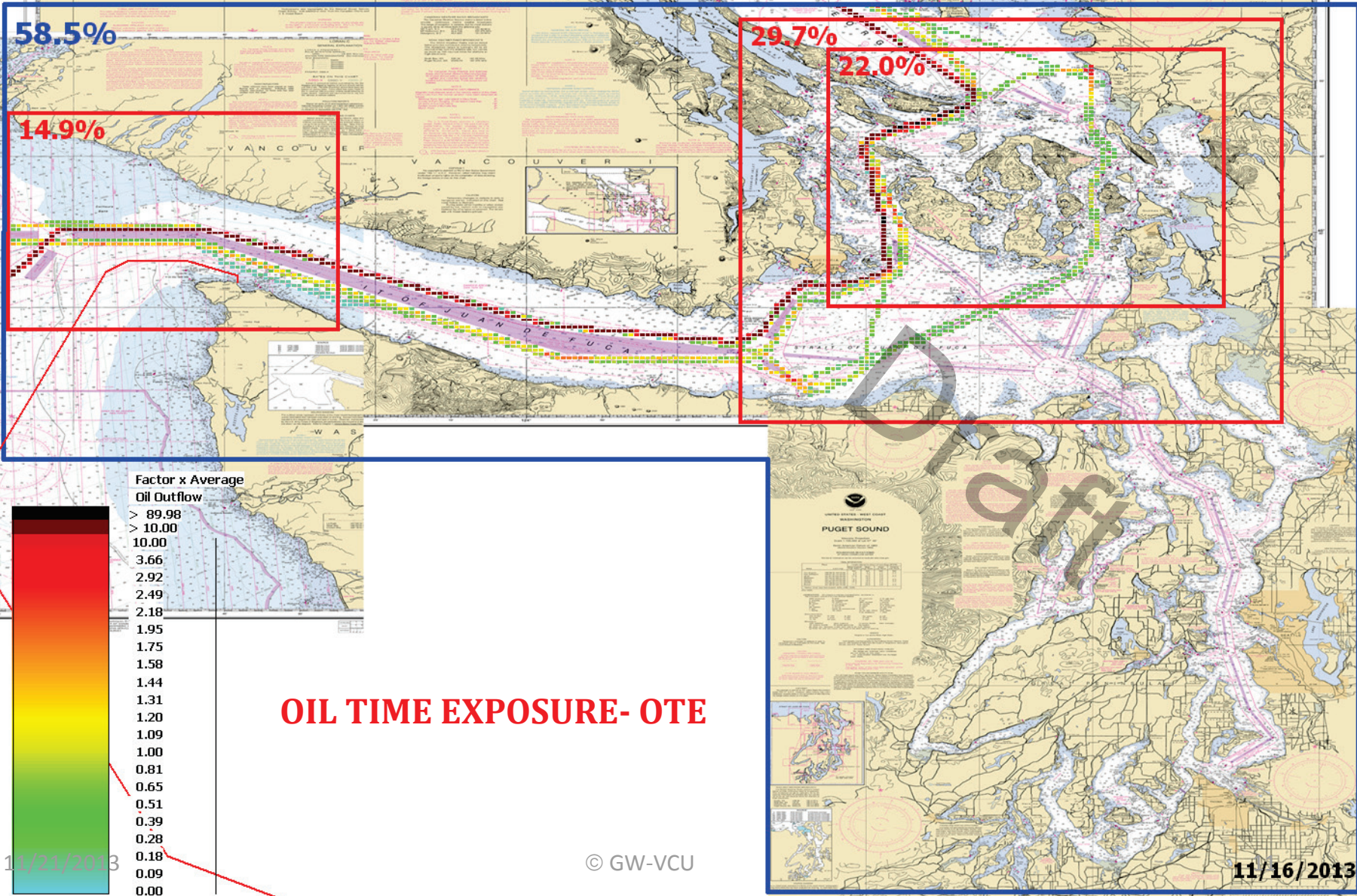
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

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



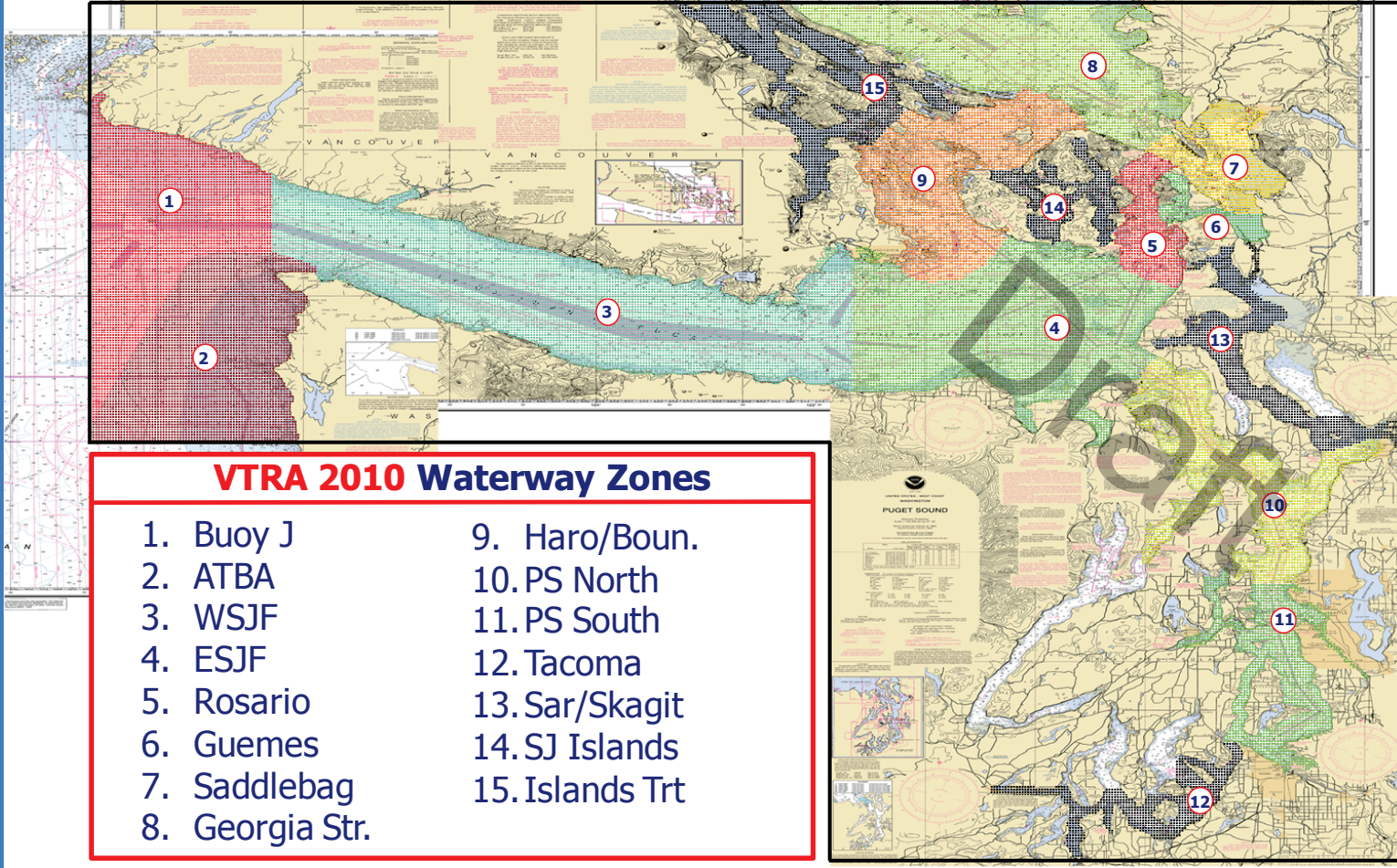
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW - KM - DP & 6 RMM's - WhatIf FV



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

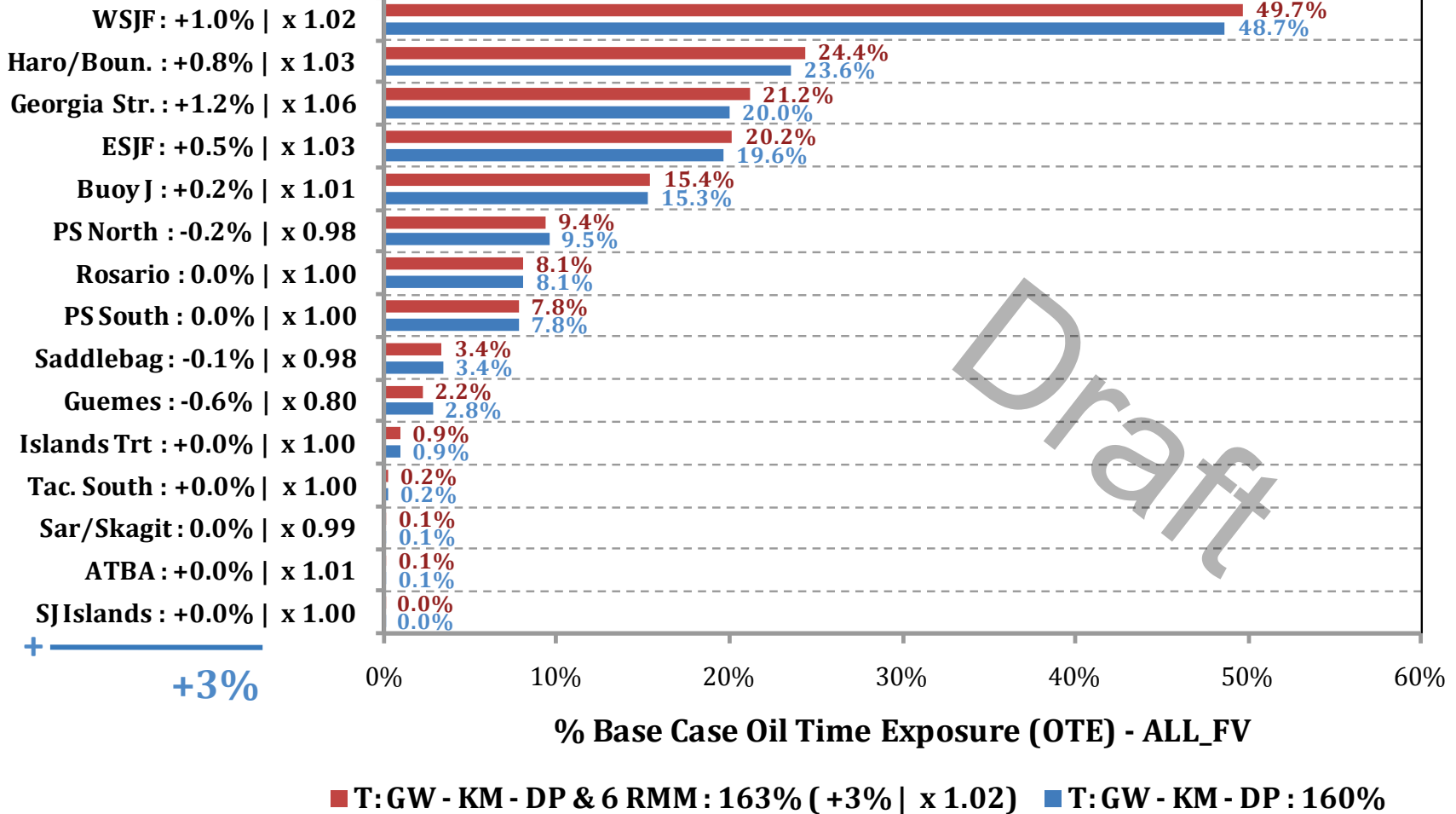
DEFINITION OF 15 WATERWAY ZONES



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

% Base Case Oil Time Exposure - ALL_FV

Waterway Zone:



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

Waterway Zone:

% Base Case Oil Time Exposure - WhatIf

