

VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

**3D Relative Risk Profile Comparison
Vessel Time Exposure**

CASE T: GW – KM – DP & One Way ATB's Rosario

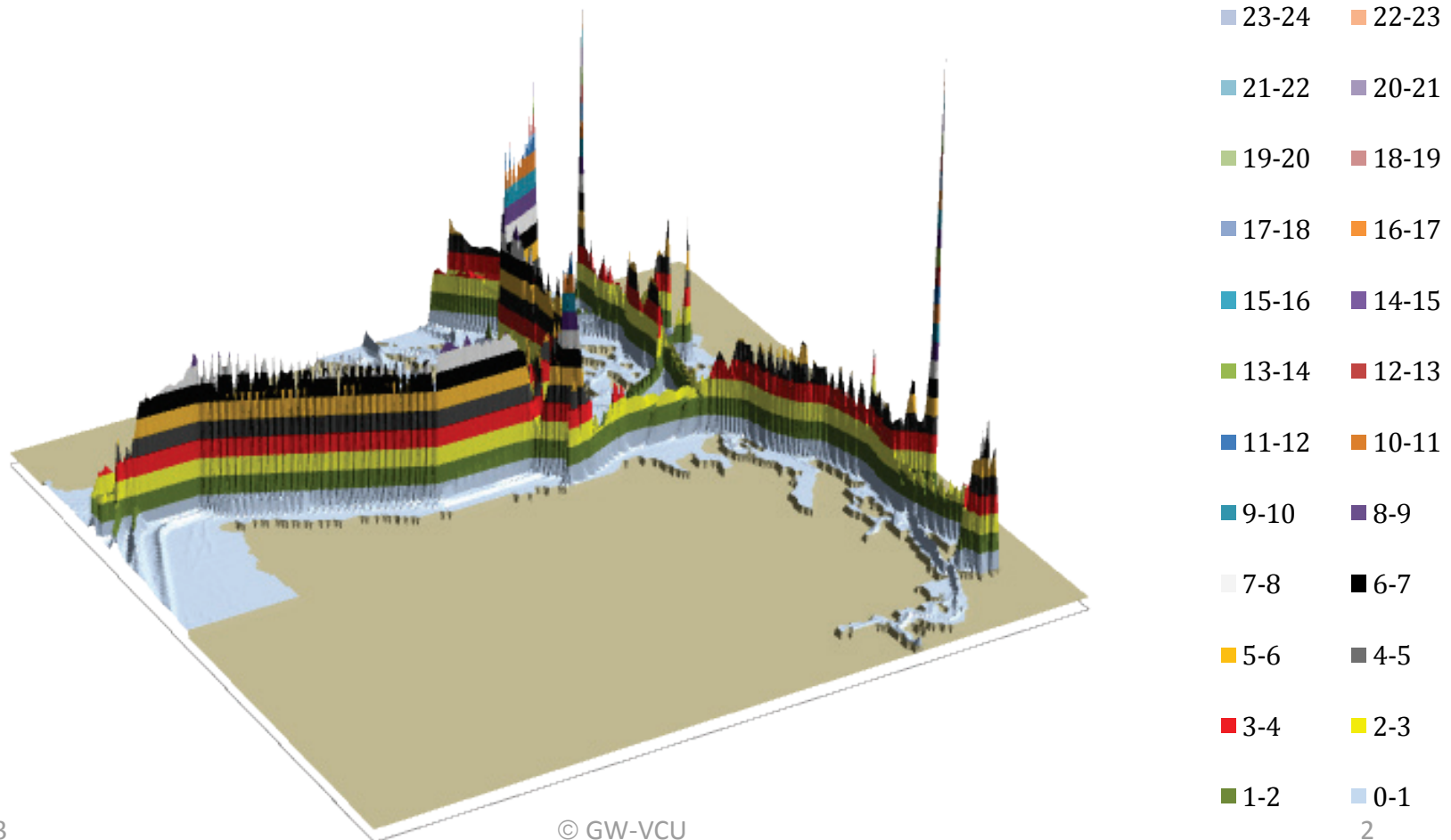
Dr. J. Rene van Dorp and Dr. Jason R.W Merrick

November 2013



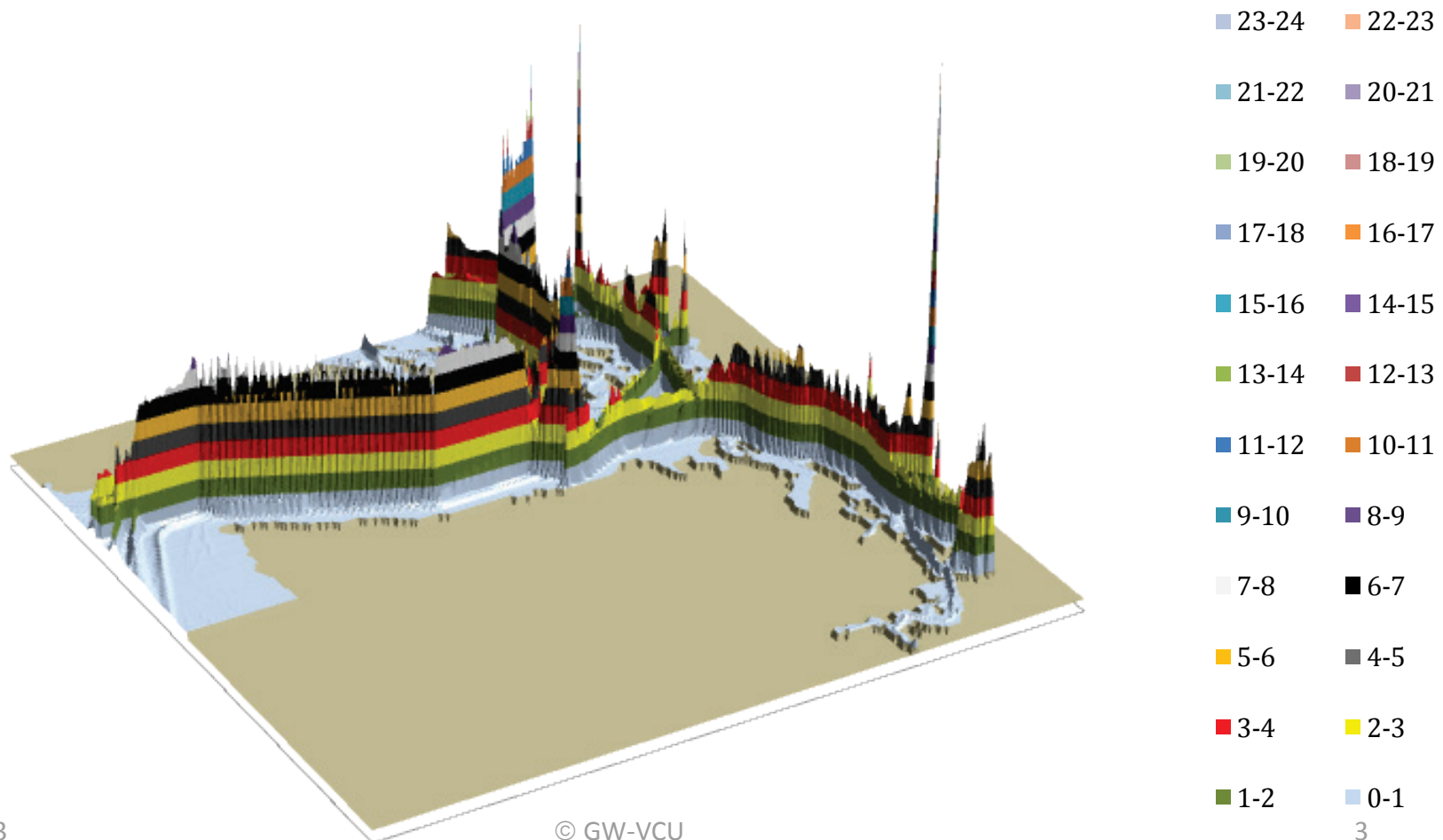
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP 3D Risk Profile All FV - Vessel Time Exposure: 125% of Base Case VTE



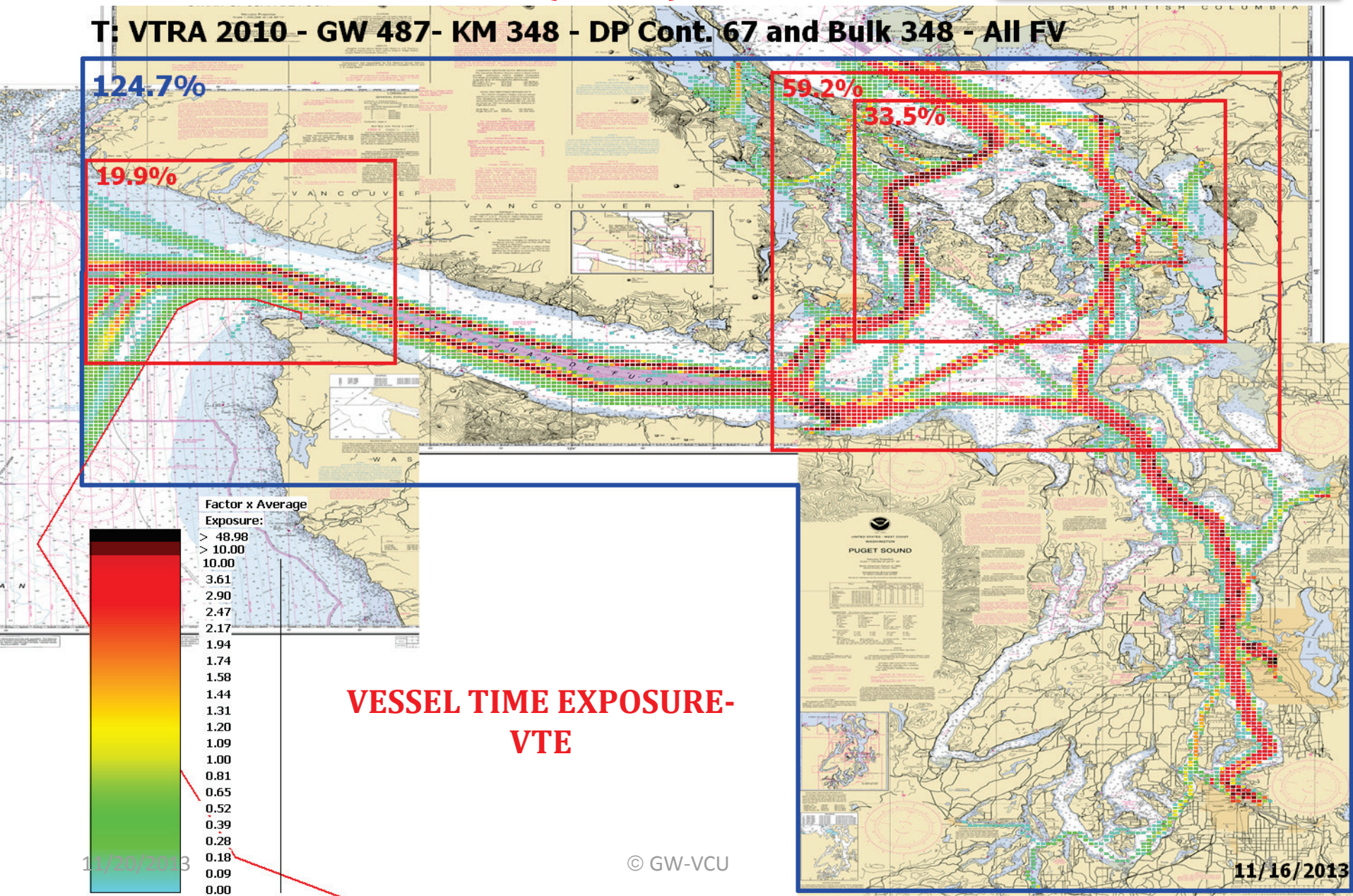
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP & OW ATB 3D Risk Profile
All FV - Vessel Time Exposure: 126% of Base Case VTE



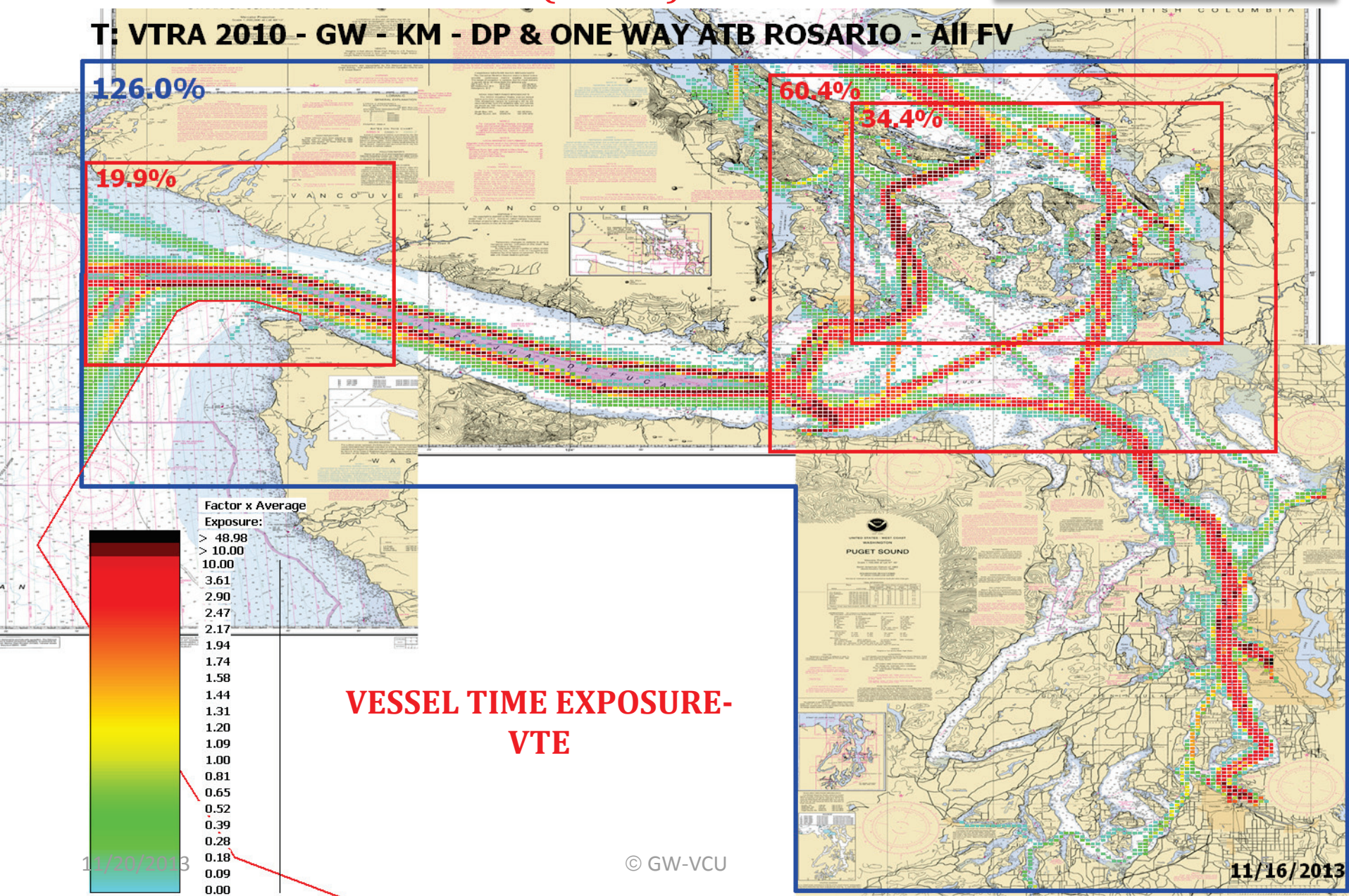
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

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



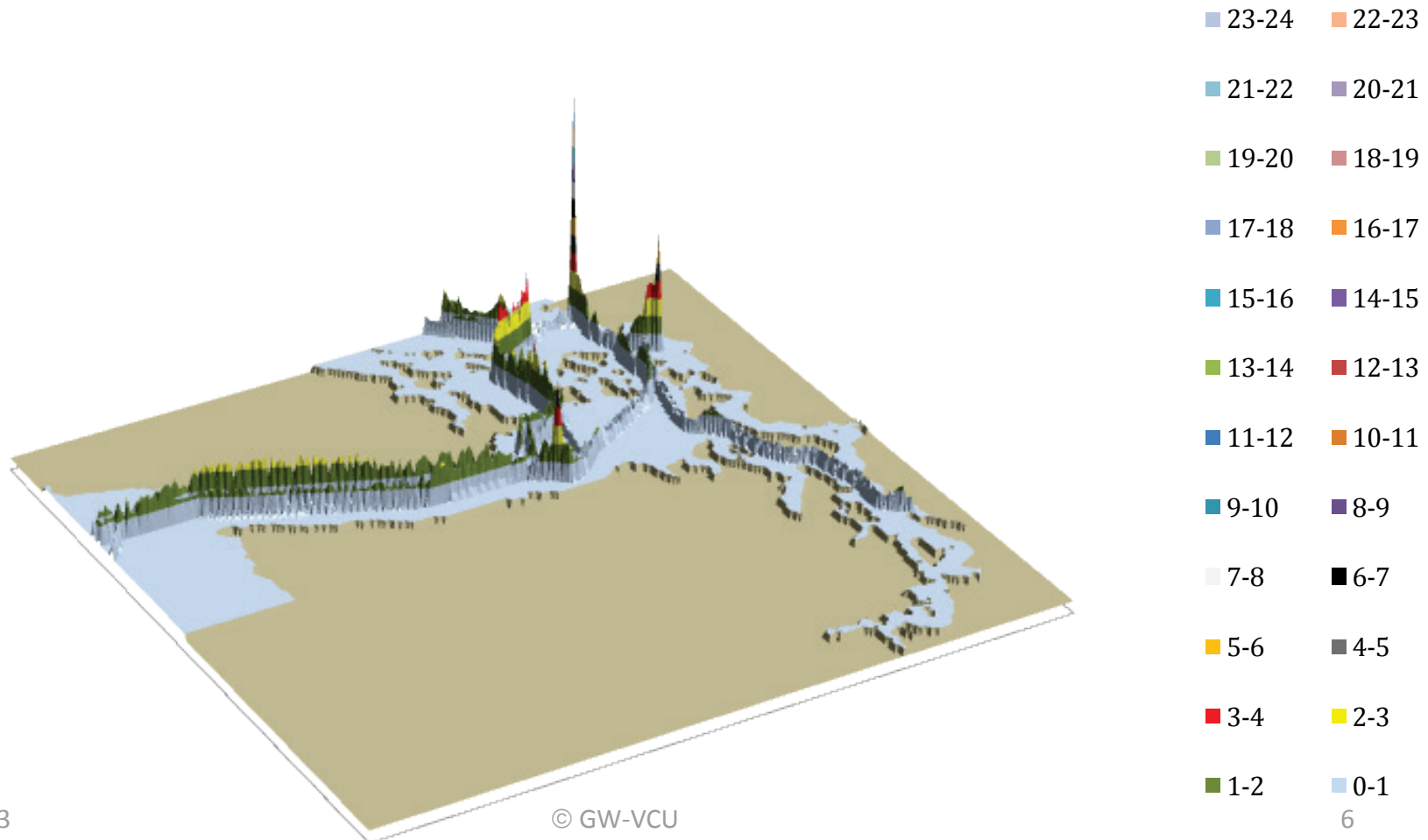
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW - KM - DP & ONE WAY ATB ROSARIO - All FV



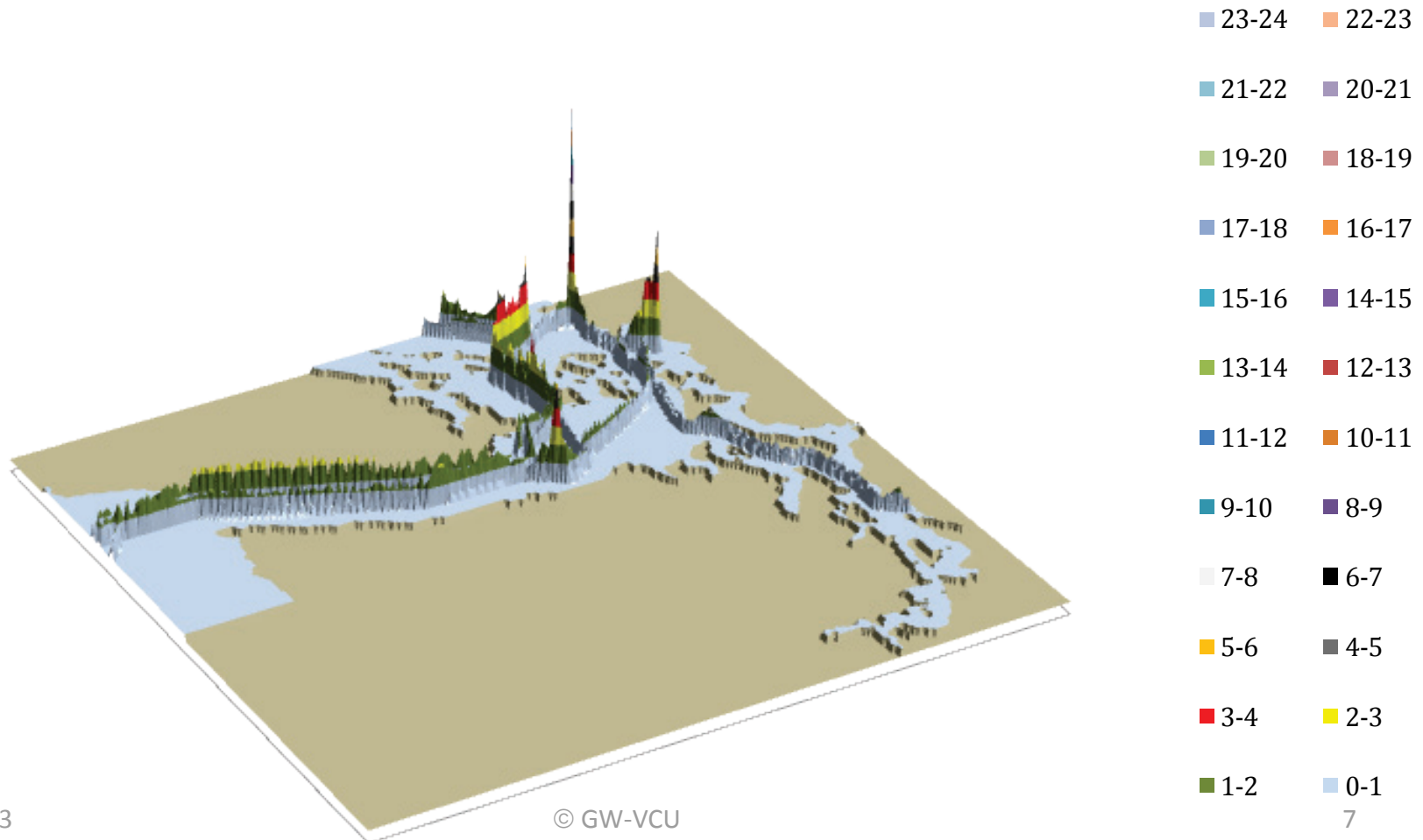
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP 3D Risk Profile What-If FV - Vessel Time Exp.: 24.4% of Base Case VTE



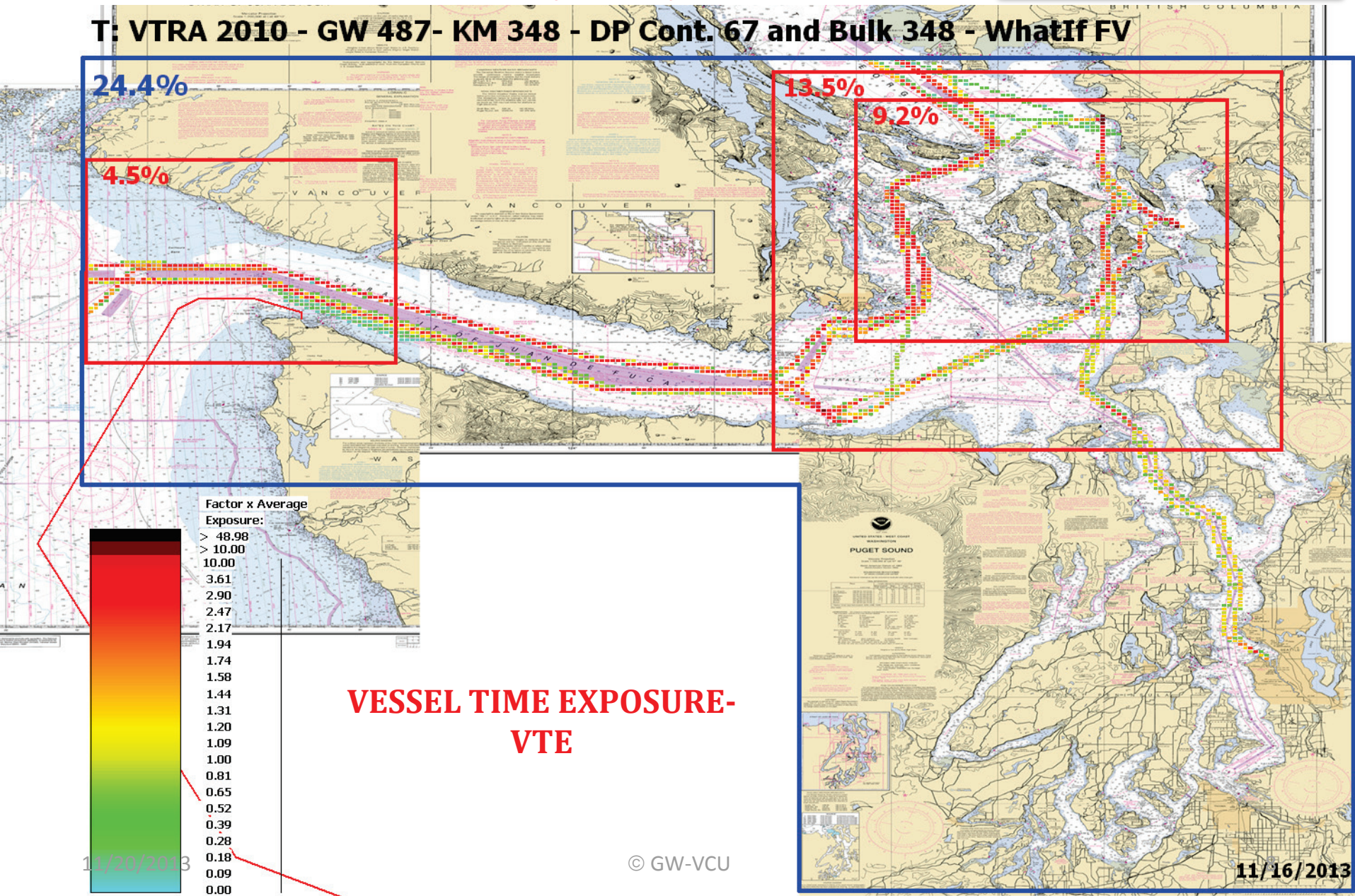
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: GW - KM - DP & OW ATB 3D Risk Profile What-If FV - Vessel Time Exp.: 25% of Base Case VTE



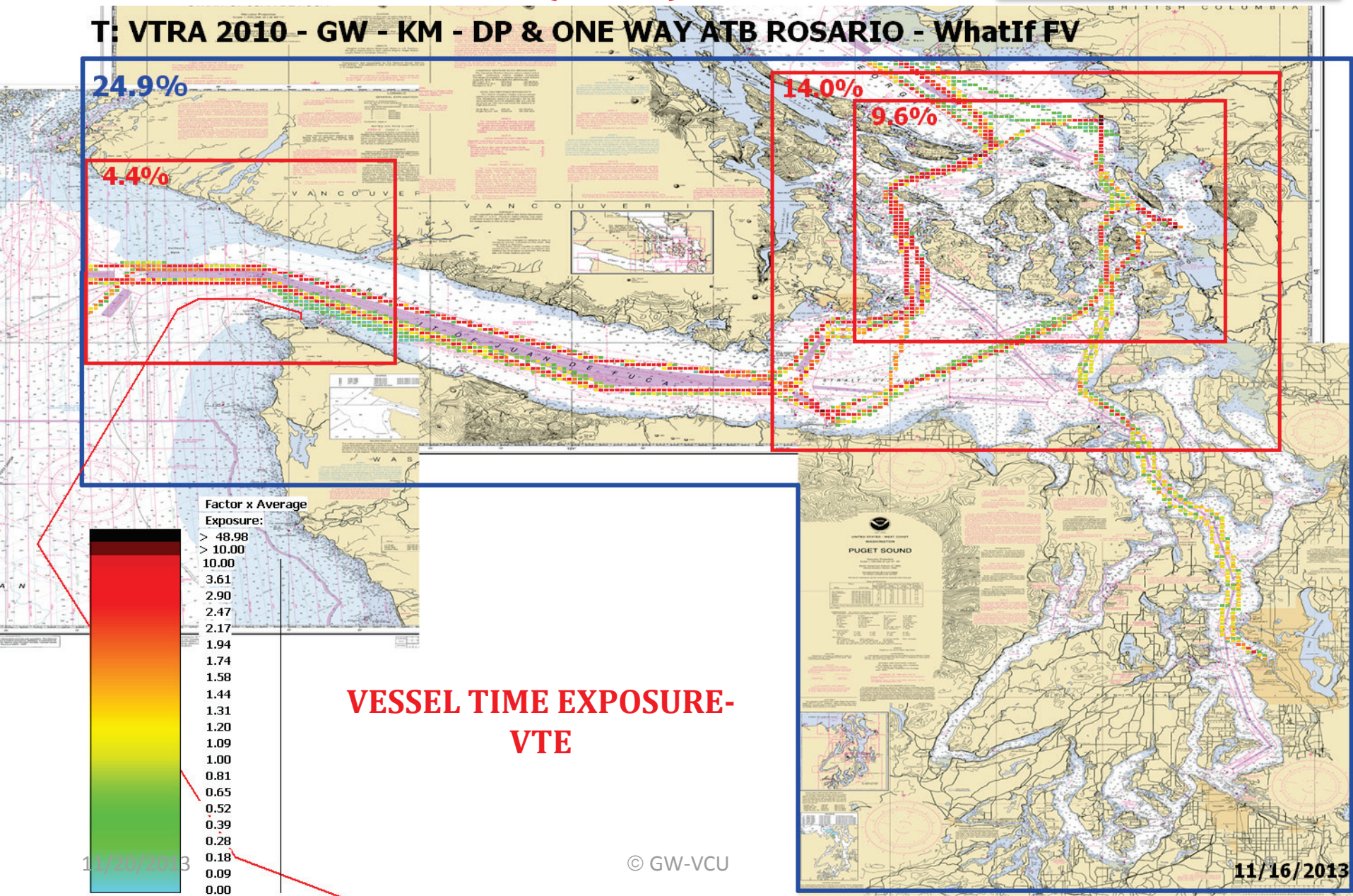
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

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



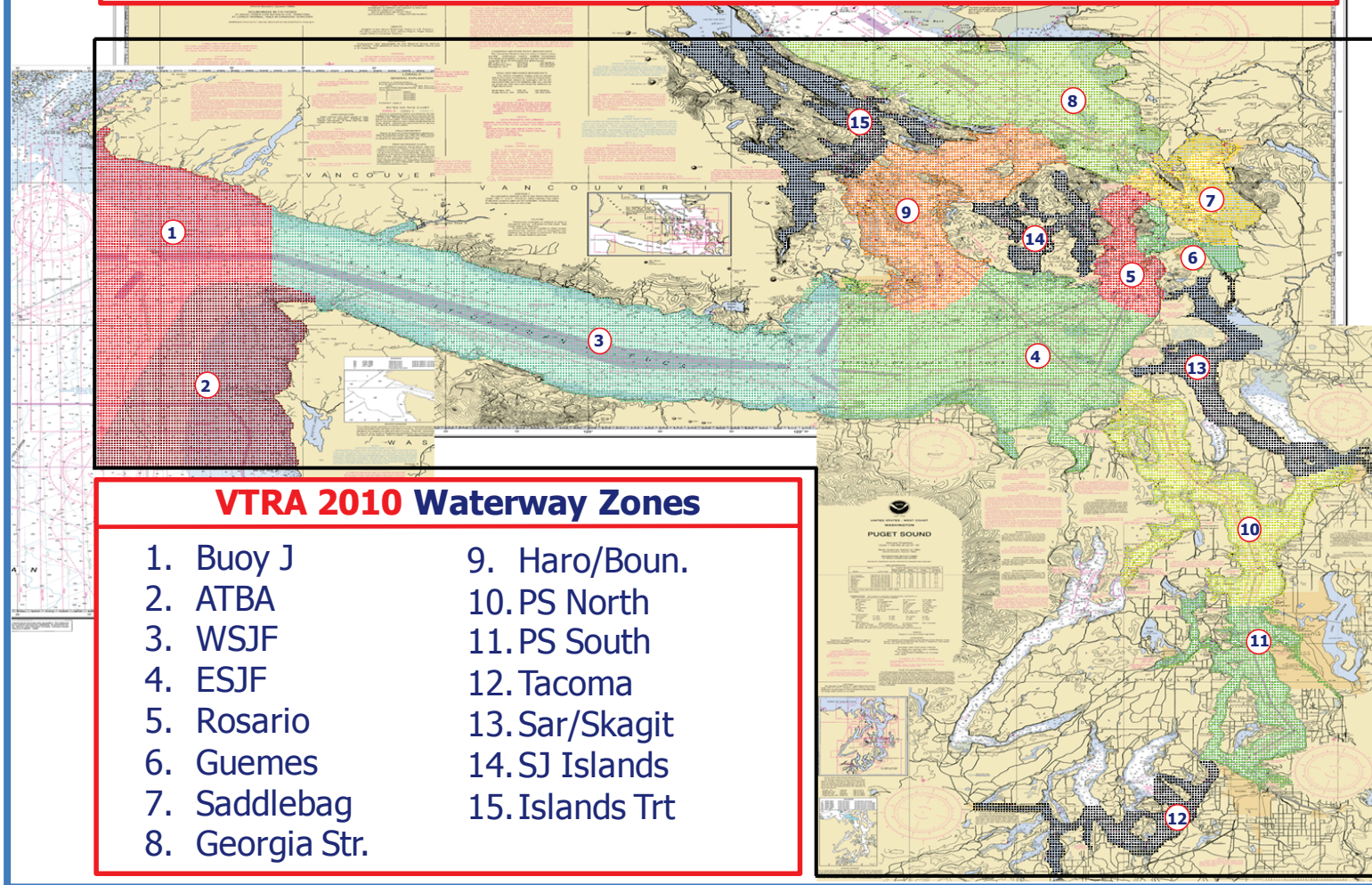
VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW - KM - DP & ONE WAY ATB ROSARIO - WhatIf FV



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

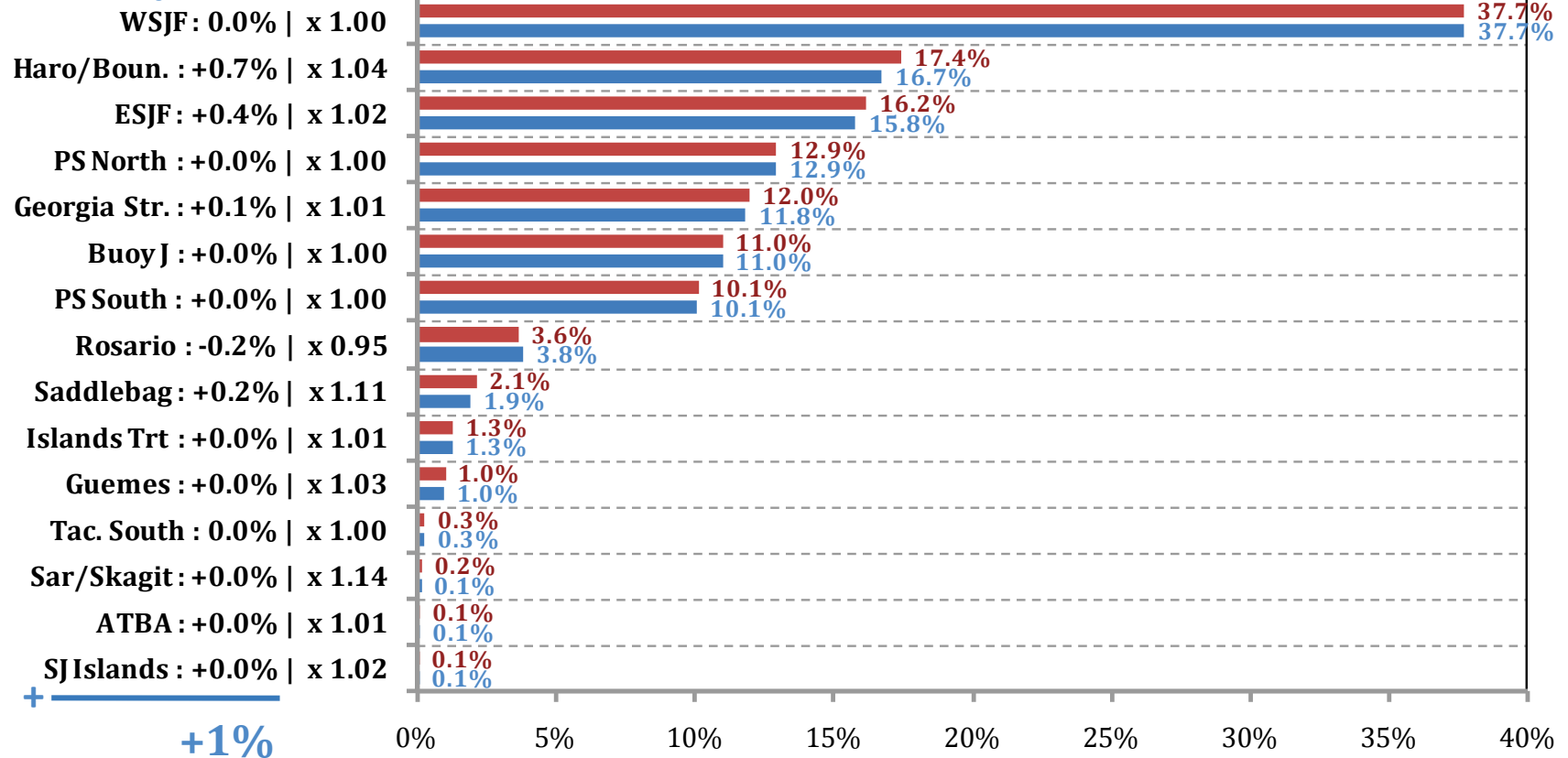
DEFINITION OF 15 WATERWAY ZONES



VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

% Base Case Vessel Time Exposure (VTE) - ALL_FV

Waterway Zone:



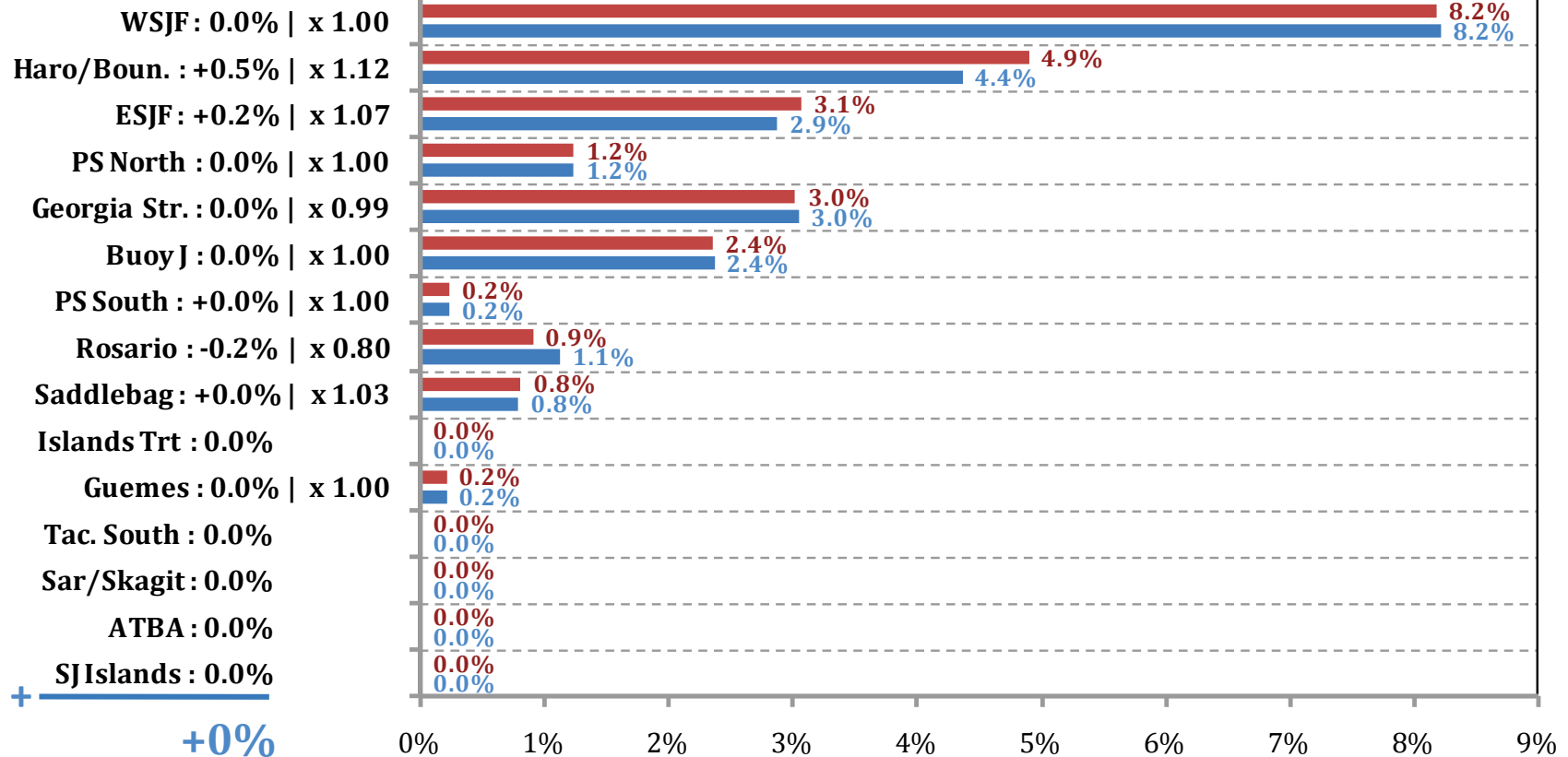
% Base Case Vessel Time Exposure (VTE) - ALL_FV

■ T: GW - KM - DP & OW ATB: 126% (+1% | x 1.01) ■ T: GW - KM - DP : 125%

VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

% Base Case Vessel Time Exposure (VTE) - WhatIf

Waterway Zone:



% Base Case Vessel Time Exposure (VTE) - WhatIf

■ T: GW - KM - DP & OW ATB : 25% (+0% | x 1.02)

■ T: GW - KM - DP : 24%