

# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

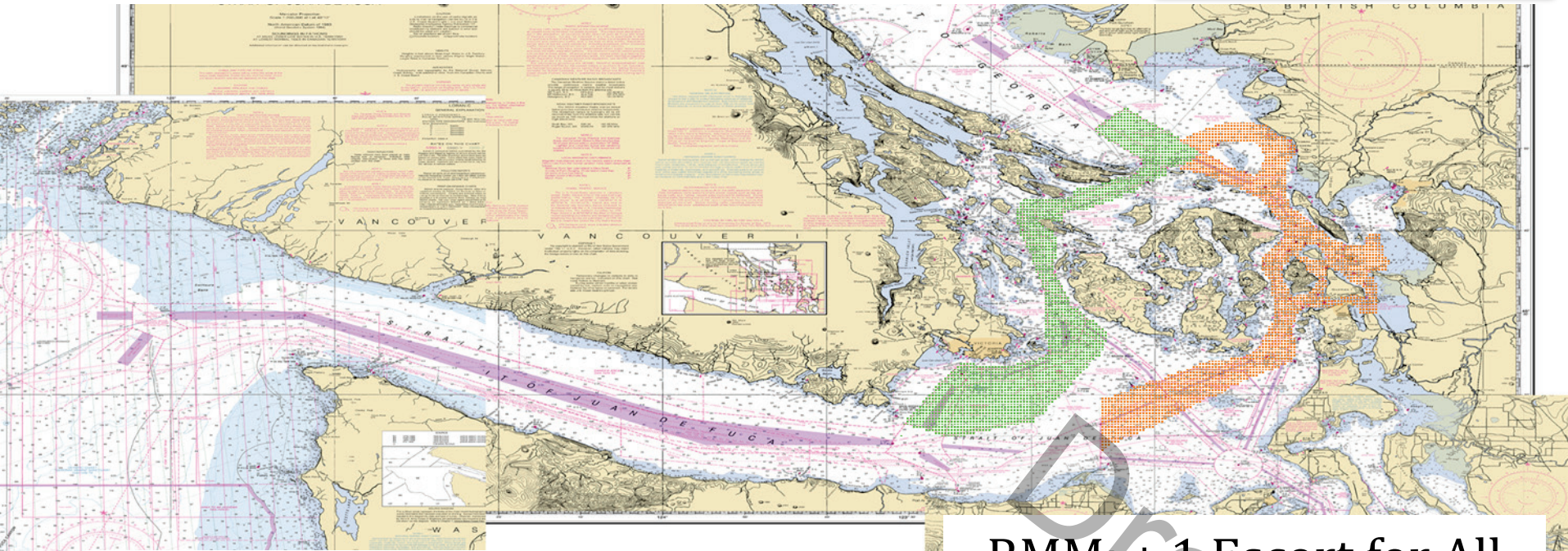
3D Relative Risk Profile Comparison  
Potential Grounding Accident Frequency  
**CASE T: GW – KM – DP & +1 Escort for all  
Focus Vessels on Haro Routes**

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

**November 2013**



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

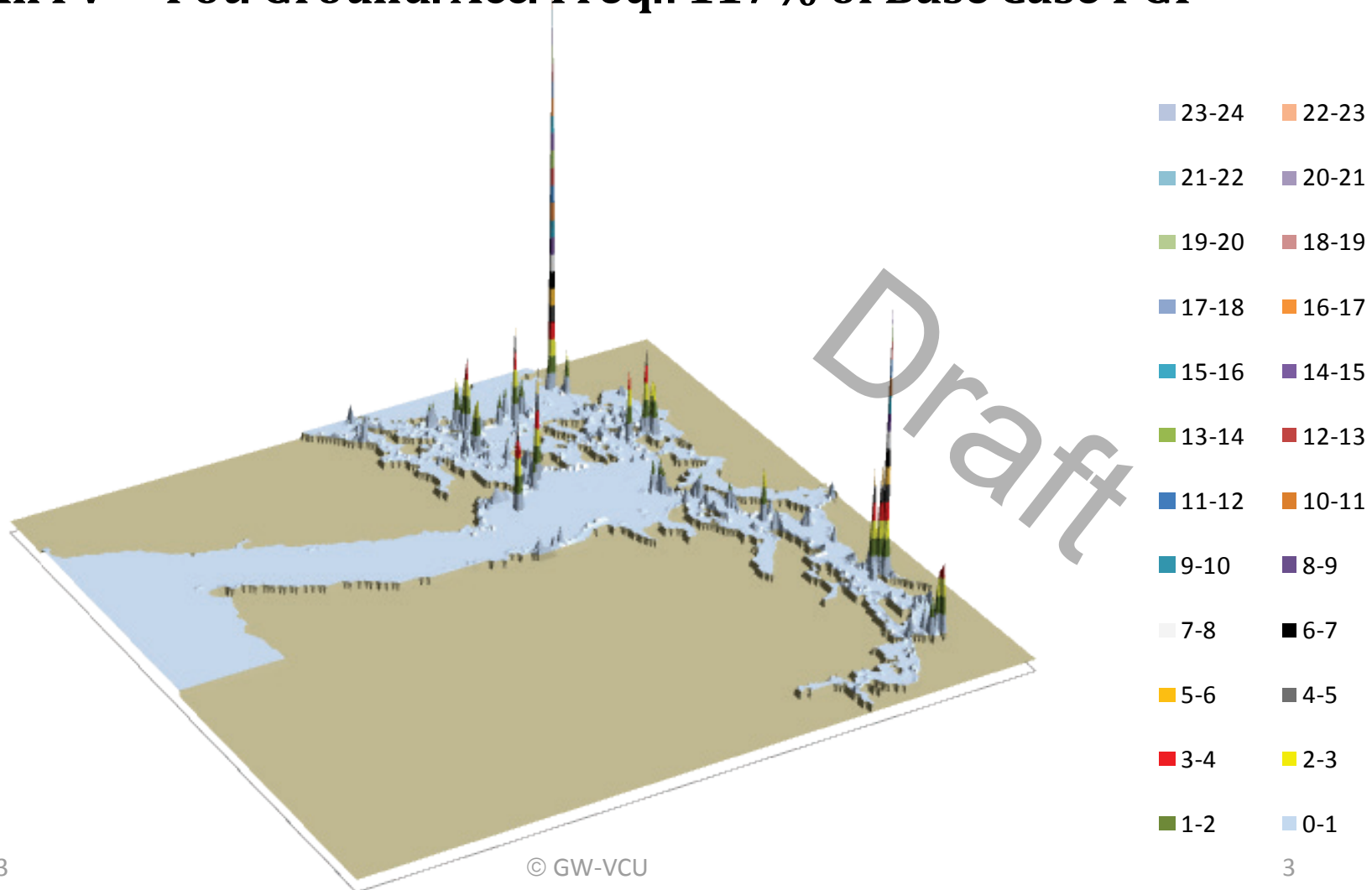


**DEFINITION OF ASSUMED LOCATIONS  
FOR ADDED ESCORT VESSEL  
FOR HARO-BOUNDARY ROUTES (GREEN)  
AND  
FOR ROSARIO ROUTES (ORANGE)**

RMM: + 1 Escort for All  
Focus Vessels  
Haro - Boundary Pass  
Routes (Green)

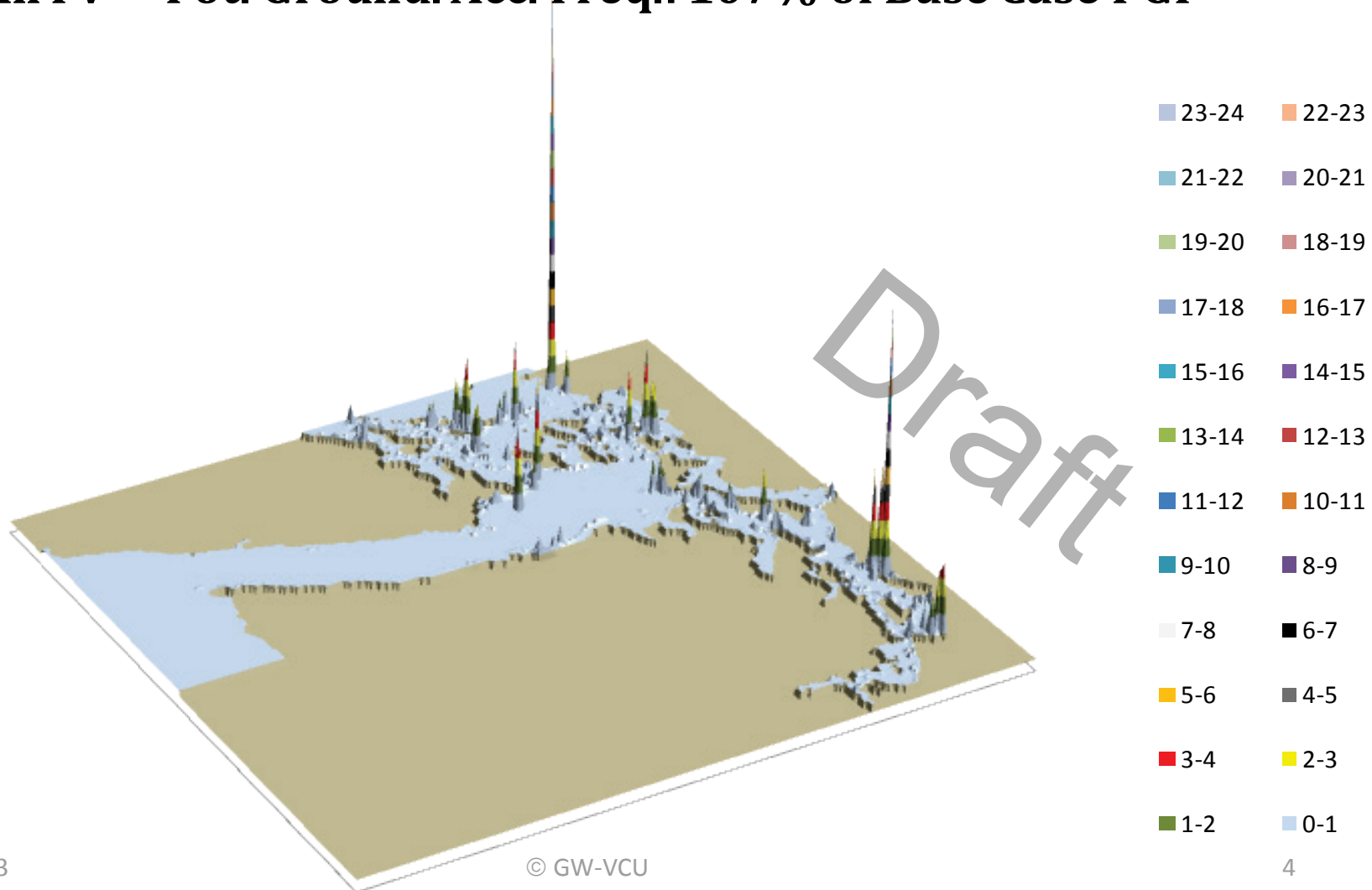
# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

## T: GW - KM - DP 3D Risk Profile All FV - Pot. Ground. Acc. Freq.: 117% of Base Case PGF



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

**T: GW - KM - DP & EH 3D Risk Profile**  
**All FV - Pot. Ground. Acc. Freq.: 107% of Base Case PGF**



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

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

116.7%

73.8%

54.0%

0.3%

Factor x Average  
# of Accidents

- > 100.00
- > 10.00
- 10.00
- 3.68
- 2.94
- 2.50
- 2.19
- 1.95
- 1.75
- 1.59
- 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

POTENTIAL GROUNDING FREQUENCY - PGF

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# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW - KM - DP & +1 ESCORT HARO-BOUNDARY - ALL FV

107.4%

0.3%

64.7%

46.6%

Factor x Average  
# of Accidents

- > 100.00
- > 10.00
- 10.00
- 3.68
- 2.94
- 2.50
- 2.19
- 1.95
- 1.75
- 1.59
- 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

POTENTIAL GROUNDING  
FREQUENCY - PGF

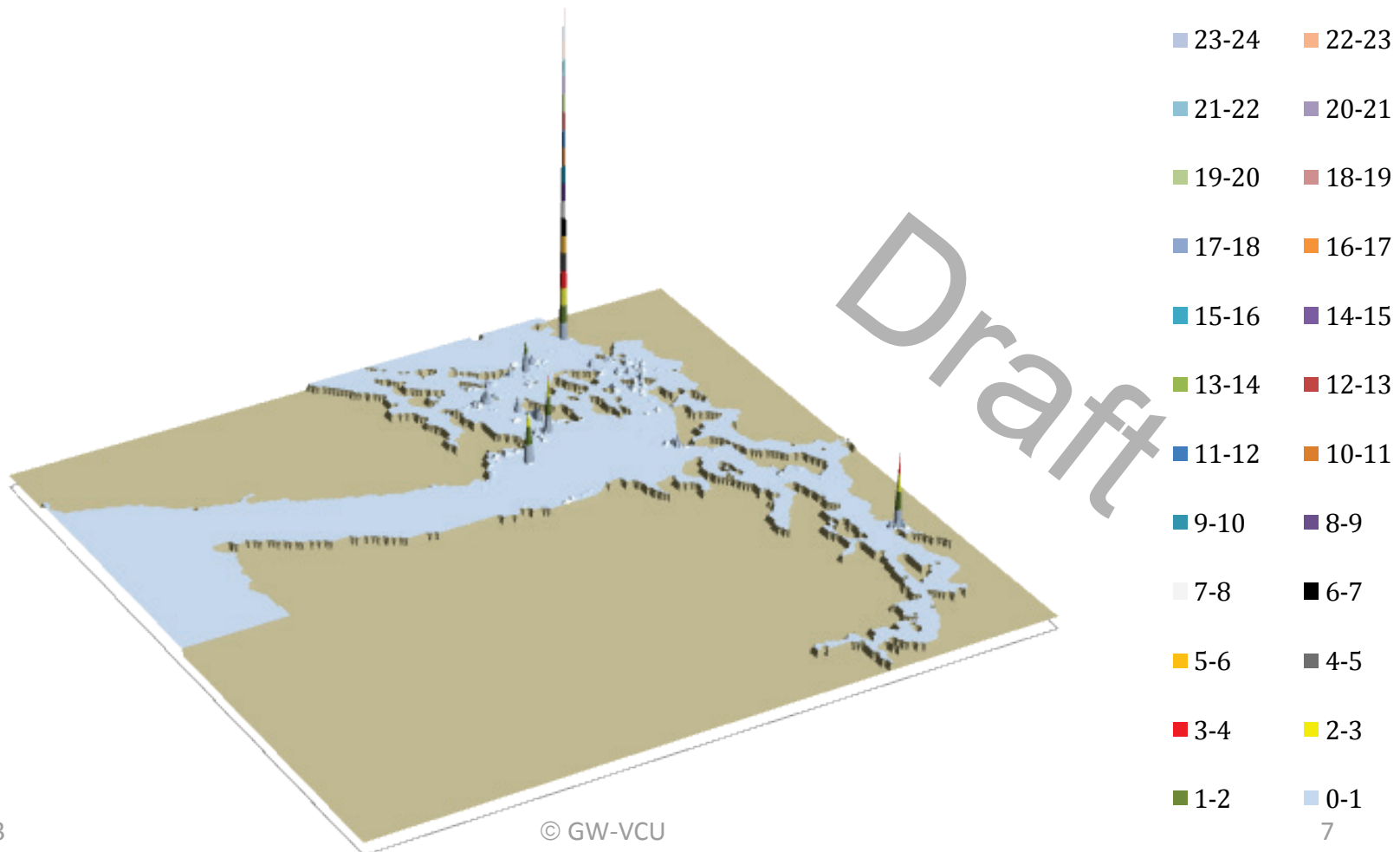
11/21/2013

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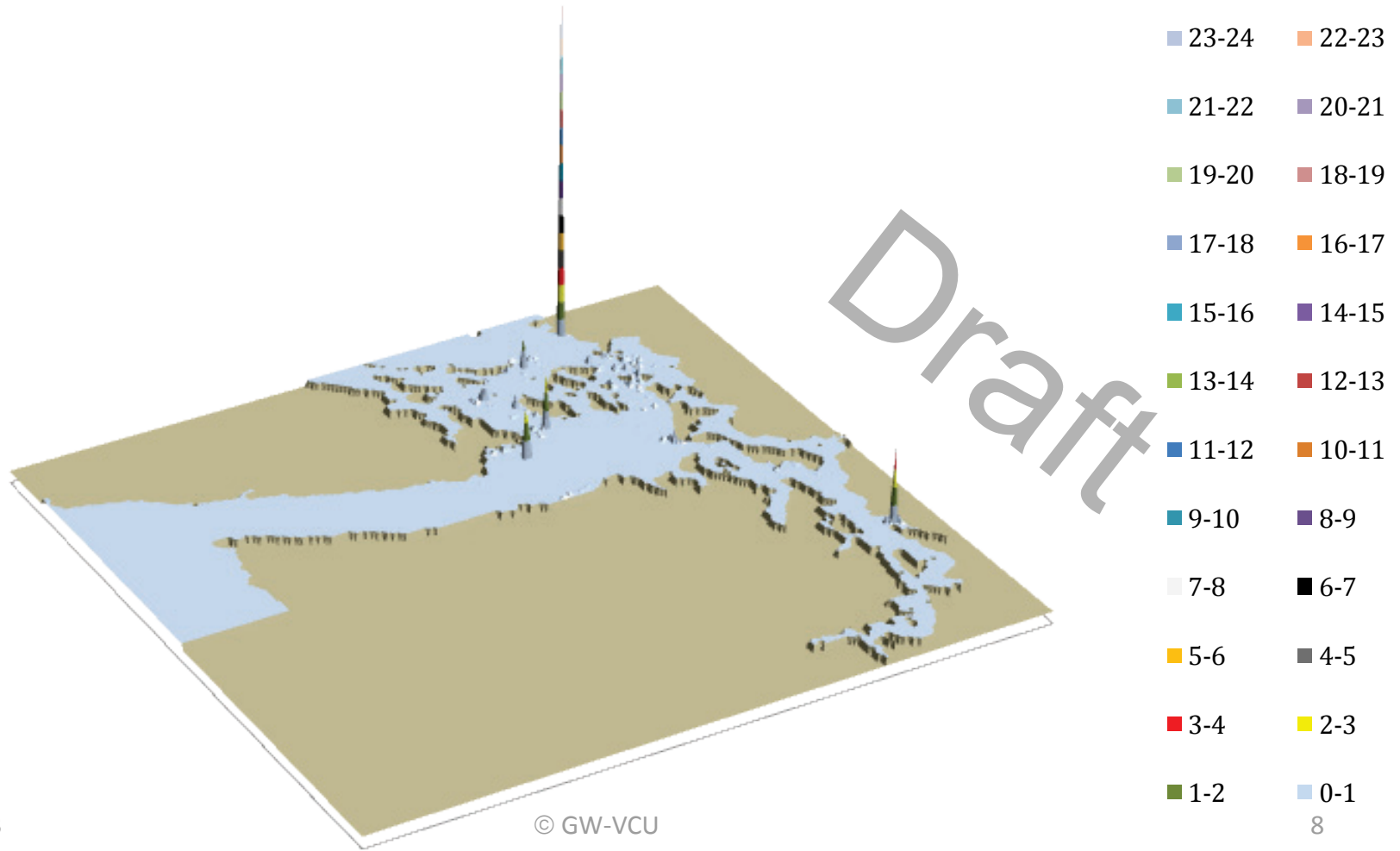
# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

## T: GW - KM - DP 3D Risk Profile What-If FV - Pot. Grou. Acc. Fr.: 19% of Base Case PGF



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

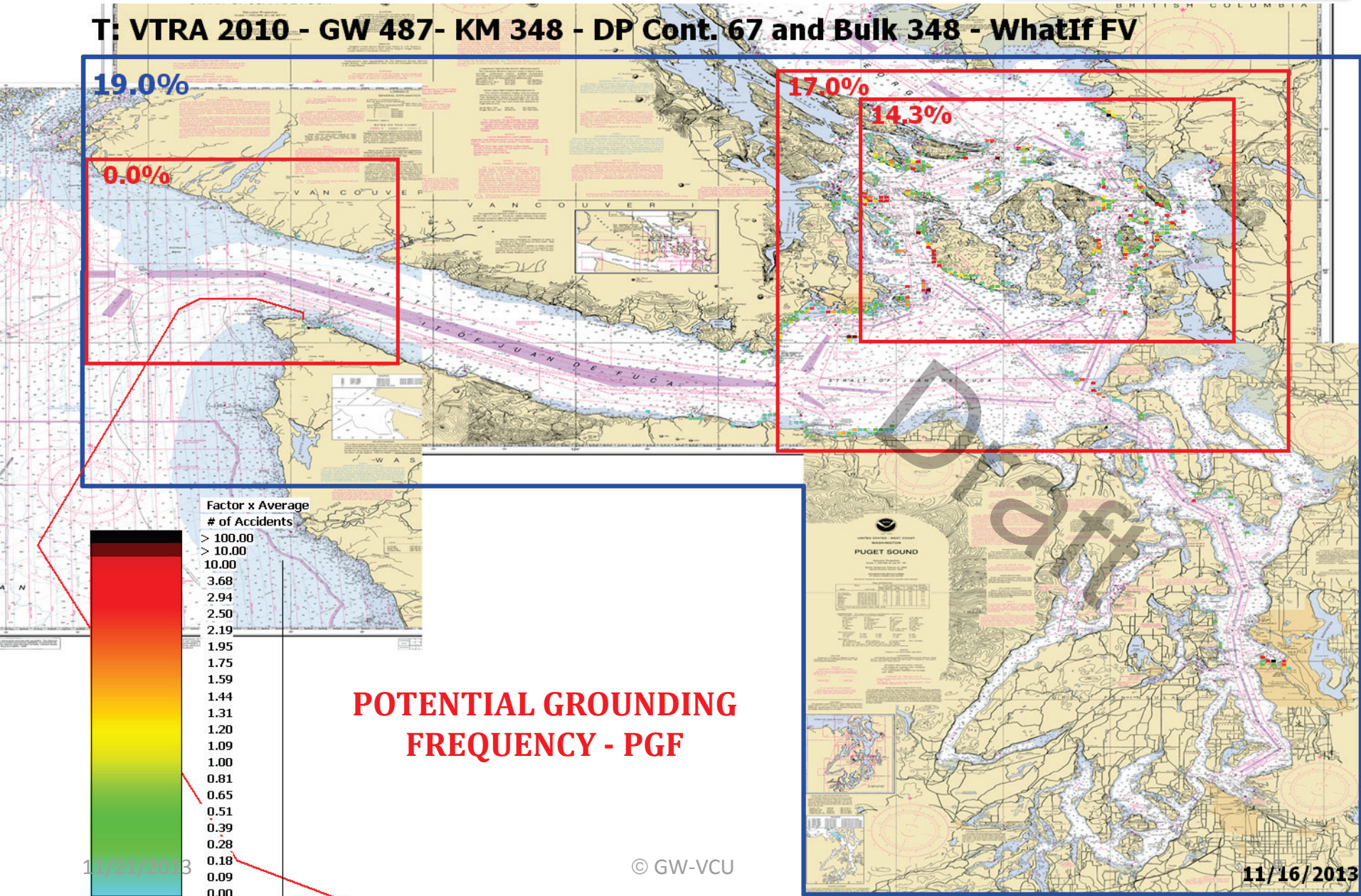
## T: GW - KM - DP & EH 3D Risk Profile What-If FV - Pot. Grou. Acc. Fr.: 16% of Base Case PGF





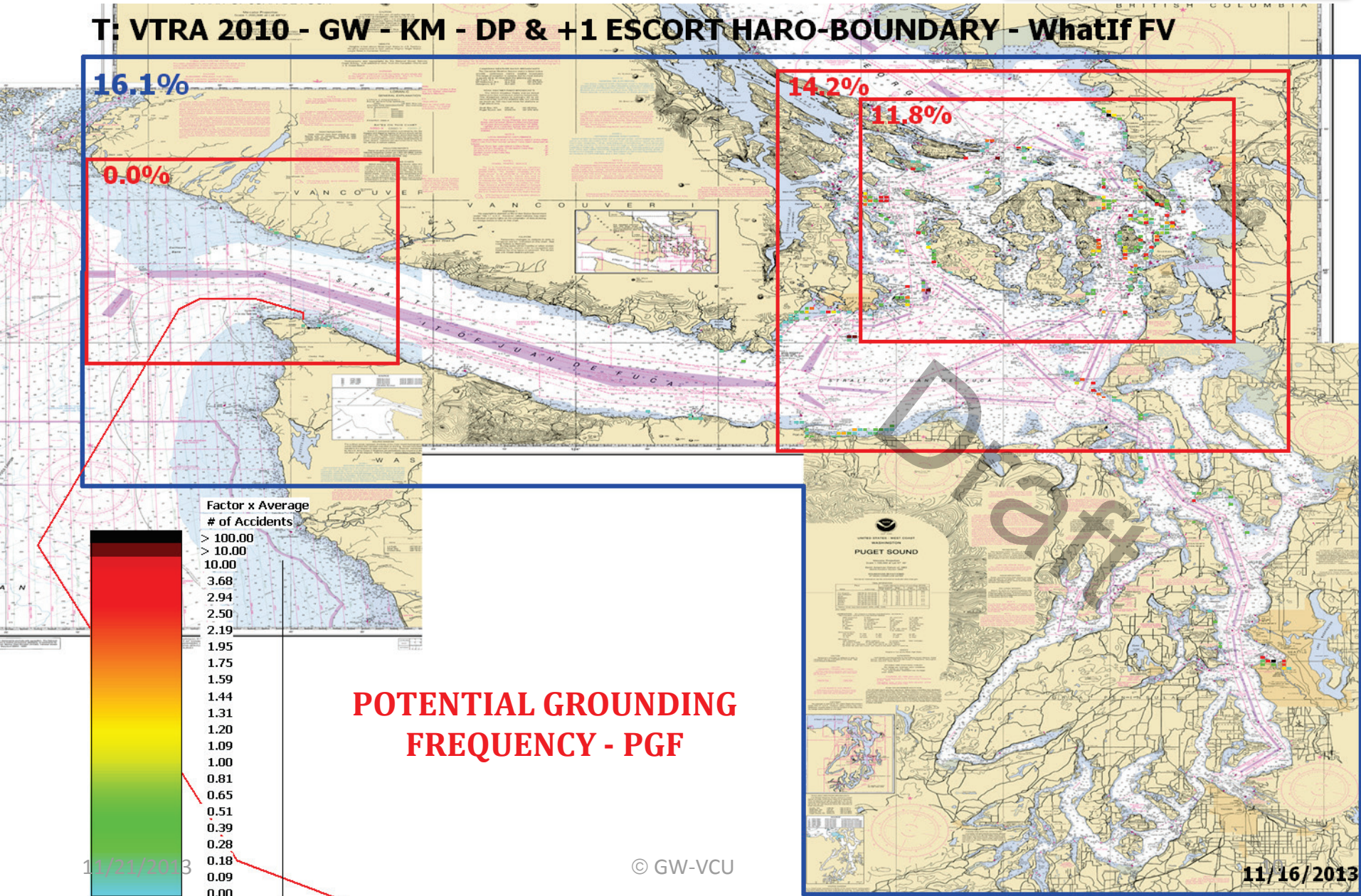
# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

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



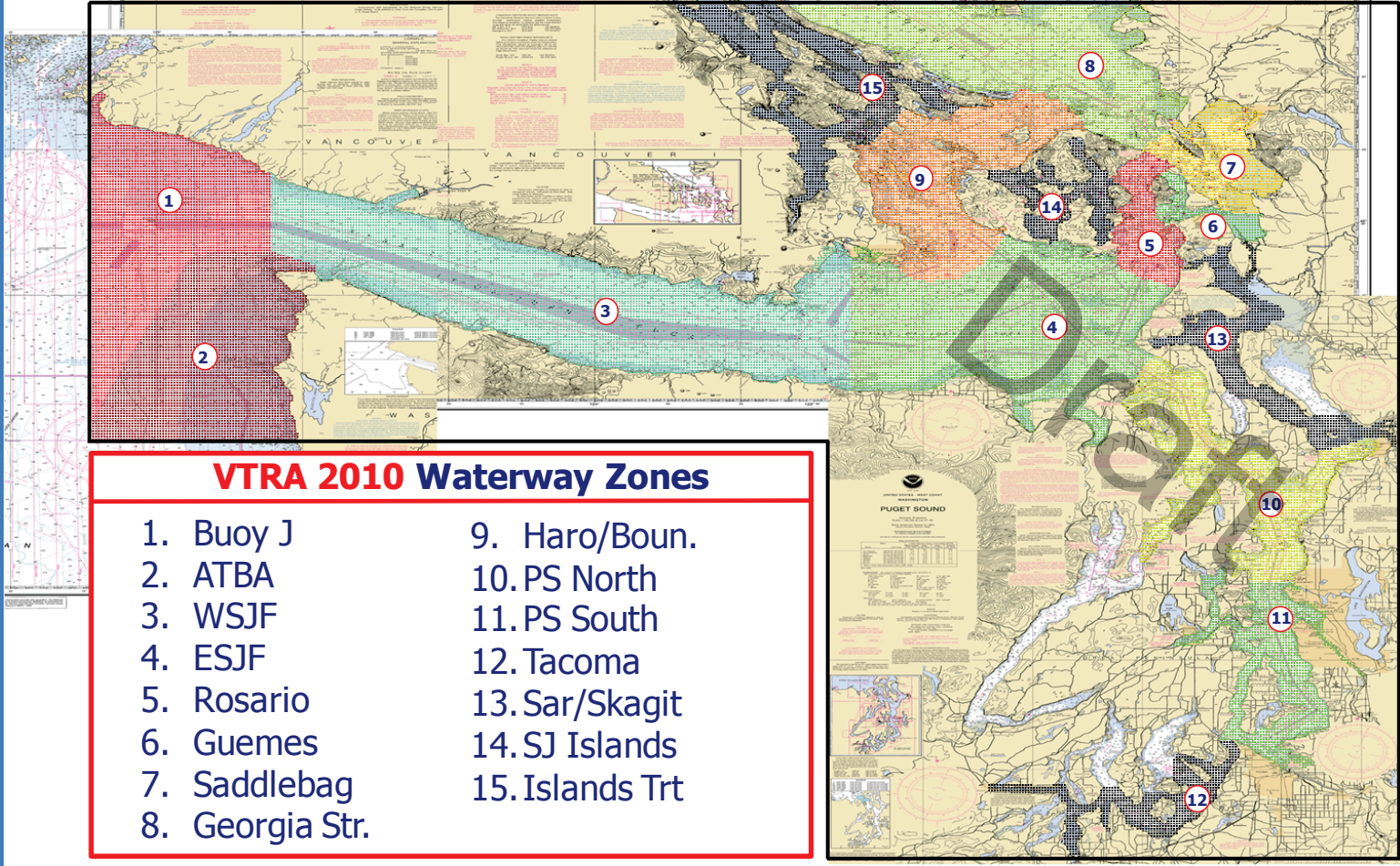
# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

T: VTRA 2010 - GW - KM - DP & +1 ESCORT HARO-BOUNDARY - WhatIf FV



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

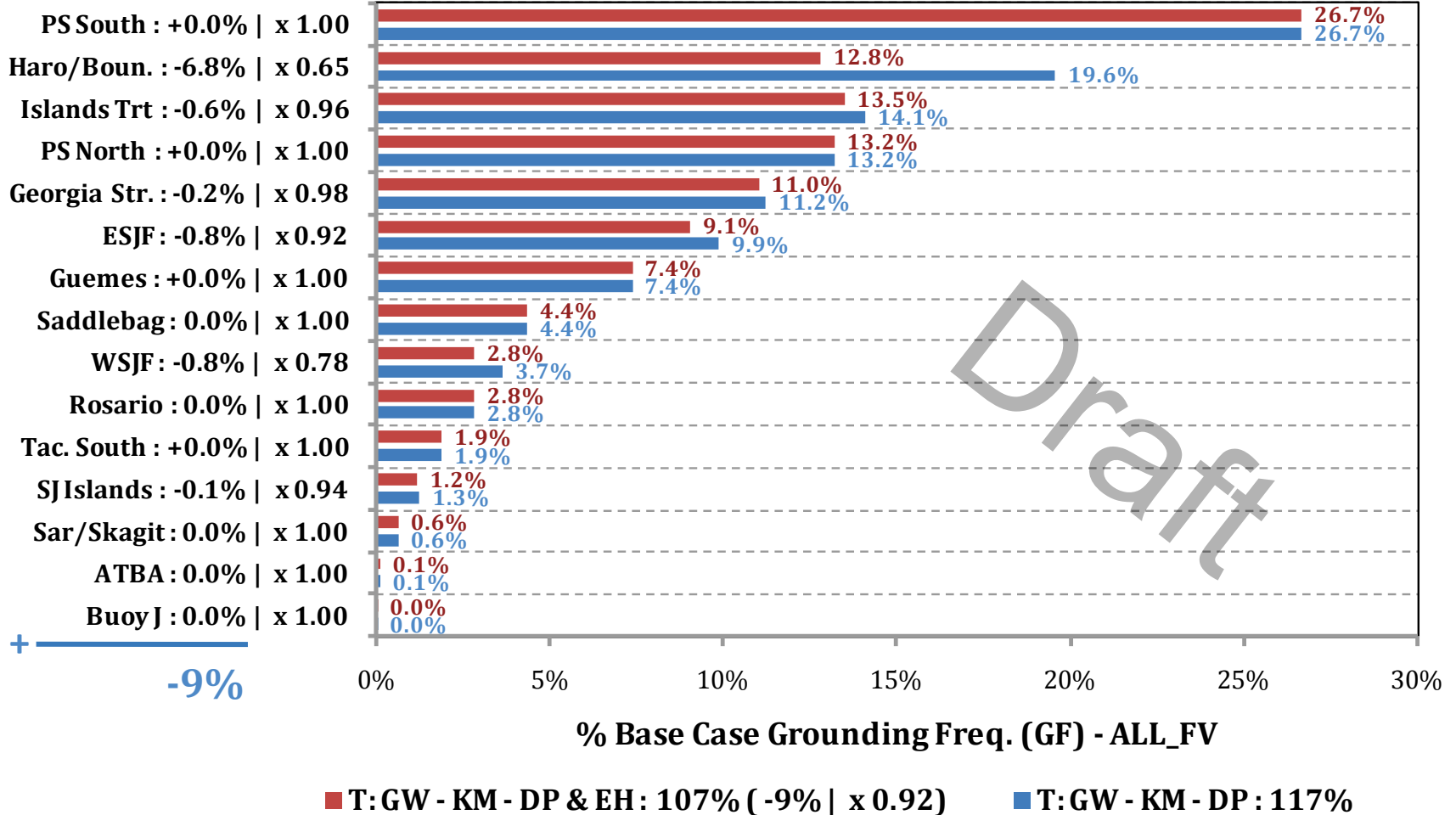
## DEFINITION OF 15 WATERWAY ZONES



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

## % Base Case Grounding Frequency - ALL\_FV

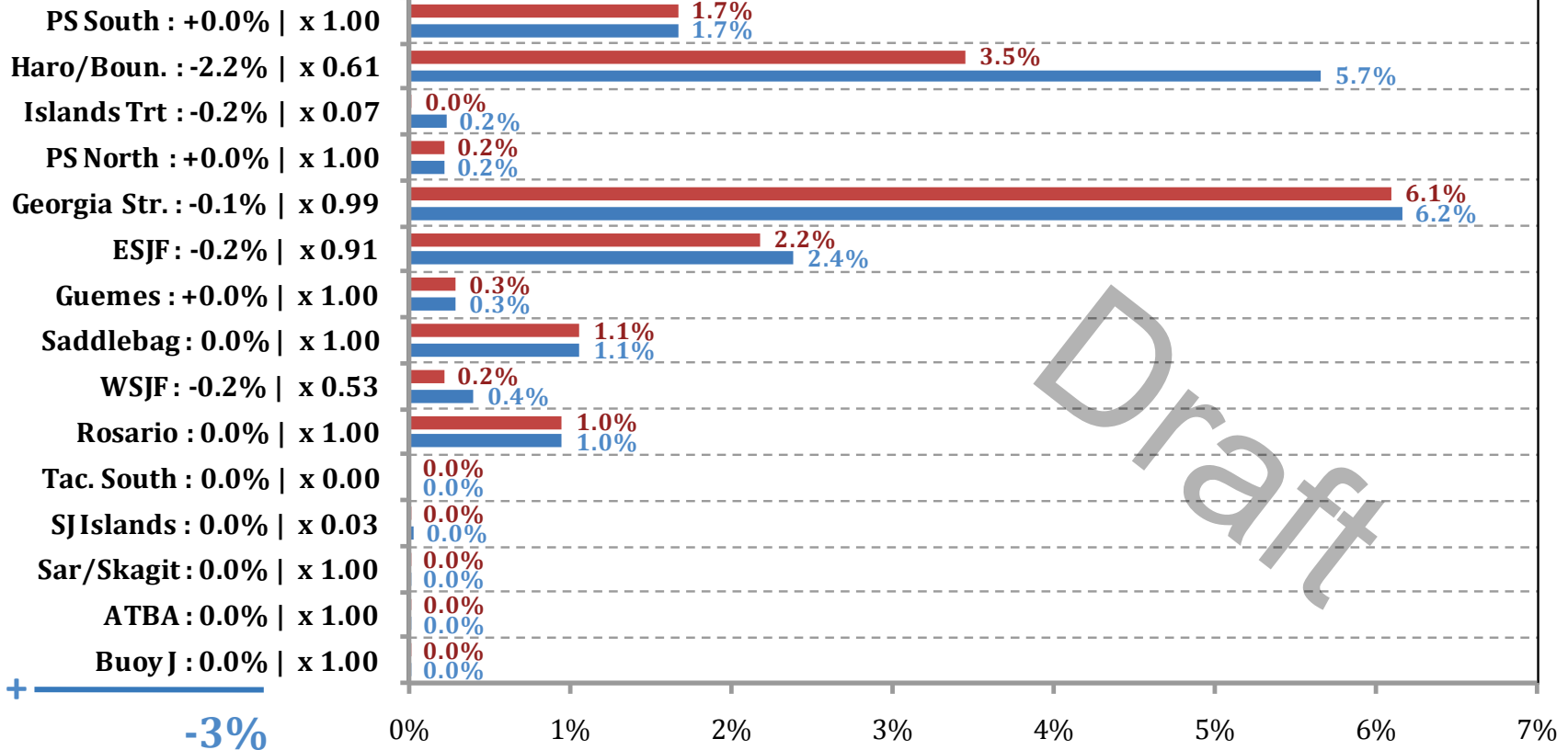
### Waterway Zone:



# VESSEL TRAFFIC RISK ASSESSMENT (VTRA) 2010

## % Base Case Grounding Frequency - WhatIf

### Waterway Zone:



## % Base Case Grounding Freq. (GF) - WhatIf

■ T:GW - KM - DP & EH : 16% (-3% | x 0.85)

■ T:GW - KM - DP : 19%