



FEBRUARY 5 - 6 • LOS ANGELES, CA

SMART PORTS

(INFORMATION TECHNOLOGY)

Title: Calculating and Communicating the ROI on Digital Solutions

Presented By: Matthew Prumm, Seaport OPX
Zac Canody, The Port of Virginia





DYNAMIC MOORING ANALYSIS

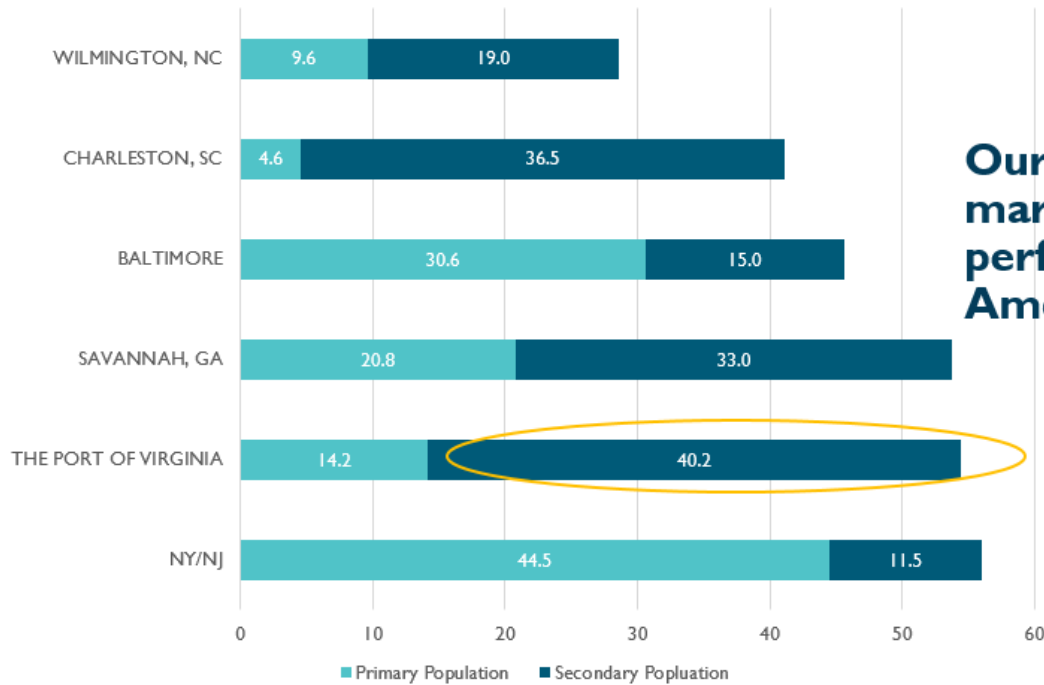
THE PORT OF VIRGINIA

**CONNECTING THE COMMONWEALTH
TO THE GLOBAL MARKET**

Zac Canody, P.E., BCEE
VPA Director, Engineering
February 5th, 2019

Matthew Prumm
B.Eng (hons) Civil, MSc, CPEng
SeaportOPX

Positioned To Move The Country's Cargo



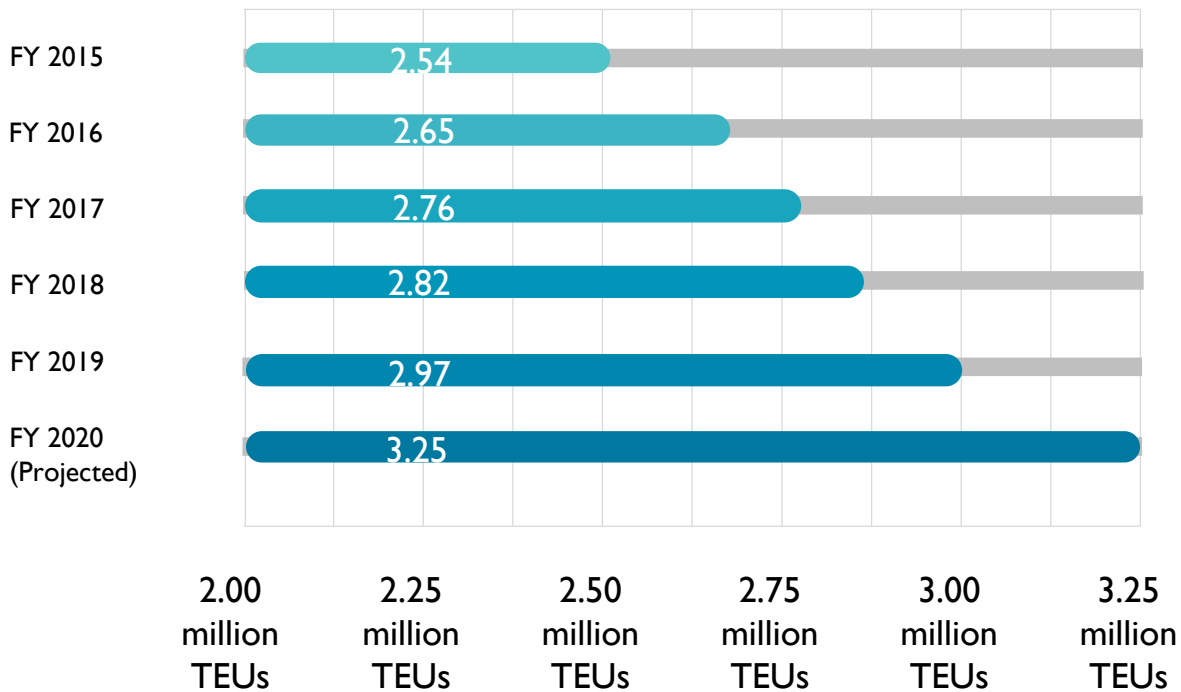
Our location and primary market size positions us perfectly to serve the American Heartland.

Source: Colliers, population categories defined by R K Johns



RECORD-SETTING VOLUMES

We are handling more than 400,000 TEUs more than we did in FY2015 – a 15% increase driven by our infrastructure investments.



BUILDING THE CAPACITY FOR GREATNESS



55' Deepening Project (\$330M)
VIG Phase 2 Expansion (\$325M)
NIT Optimization (\$350M)
NIT CRY Expansion (\$20M)
VIP BUILD (\$26.5M)
6-Year Capital Outlay (\$1.6B)



Stewards of Tomorrow





**Virginia
International
Gateway**

- Completed Fall 2019**
- 1.2 million container capacity (annually)
 - Extended rail operation
 - Extended berth
 - Expanded truck gates
 - 4 new ship-to-shore cranes

By Fall 2020:

- 1.2 million annual container capacity at NIT South (+46%)
- 26 lane truck gate at NIT North, 16 lanes at NIT South
- Direct connectivity to I-564
- 2 new additional ship-to-shore cranes

**Norfolk
International
Terminals**



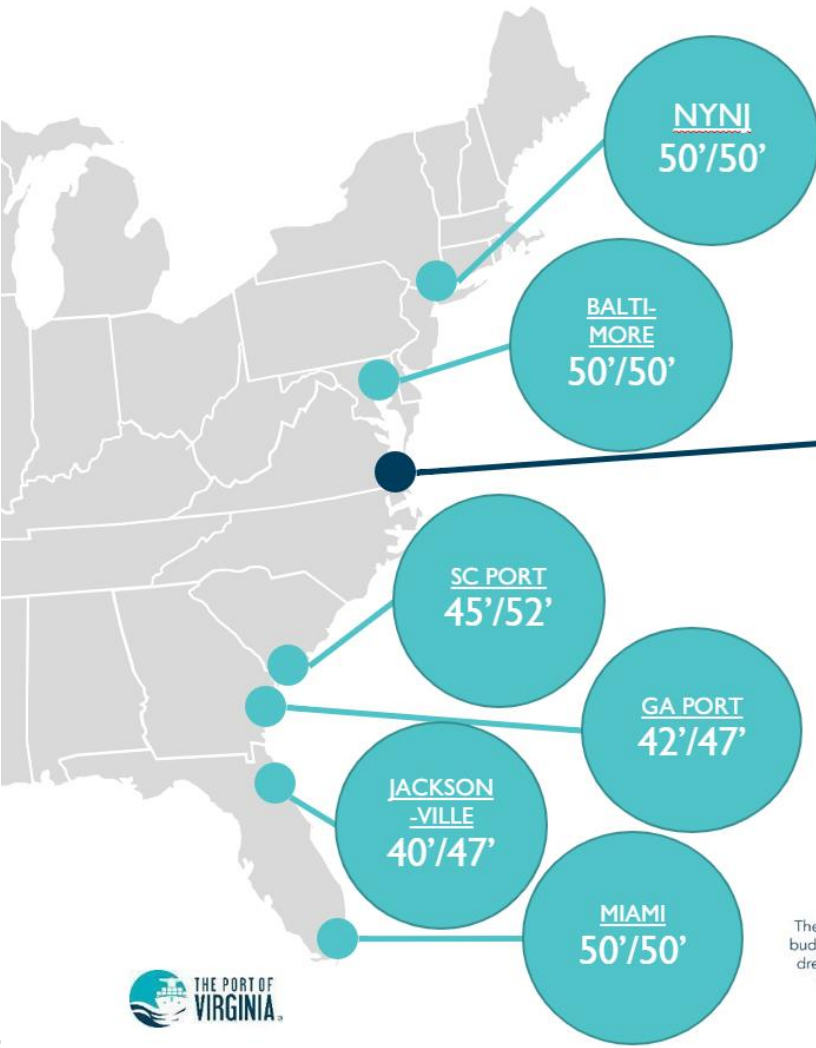
Norfolk Harbor Channels Navigation Improvements

WIDER
DEEPER
SAFER
2020



EAST COAST PORT DEPTHS

By 2025, The Port of Virginia will be the only port of the US East Coast with a 55+' channel depth.



THE PORT OF VIRGINIA®

50' / 55+'



NOV '17

The governor-elect's proposed budget includes the cost for the dredging project's preliminary engineering and design



MAY '18

The Virginia Legislature approves \$350 million for the project's engineering, design and construction



JUN '18

The U.S. Army Corps of Engineers gives its final approval for it to move ahead



EARLY '20

Construction on deepening the channel to 55 feet and widening in certain areas begins*



EARLY '25

The dredging work is complete, and Virginia is home to the deepest port on the U.S. East Coast*
*Proposed schedule



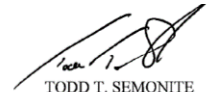
Stewards of Tomorrow



Norfolk Harbor Navigation Improvements

- Completed the GRR 6 Months Ahead of Schedule
- Chief's Report Signed (June 2018)
- Preconstruction Engineering and Design (PED) – Complete in June 2019
- Construction Start – 2020

*Strenuously Endorse
THIS CRITICAL PROJECT -
GRANT PROJECT FOR "ENRICHING
THE ECONOMY" AND PROTECTING
MARITIME RESOURCES - WHILE PROTECTING
THE ENVIRONMENT!! STARTING
BY TO BEGIN CONSTRUCTION!!
REPORT IS 6 MONTHS AHEAD OF
SCHEDULE!*


TODD T. SEMONITE
Lieutenant General, USA
Chief of Engineers

We're doing this faster than any other navigation project EVER!



WIDER
DEEPER
SAFER
~~2020~~
2019

Our Challenge

- Larger Ships = Longer Calls
- Longer Calls = More Susceptibility to Adverse Weather Conditions
- As weather condition changes, you must make decisions that have costly implications

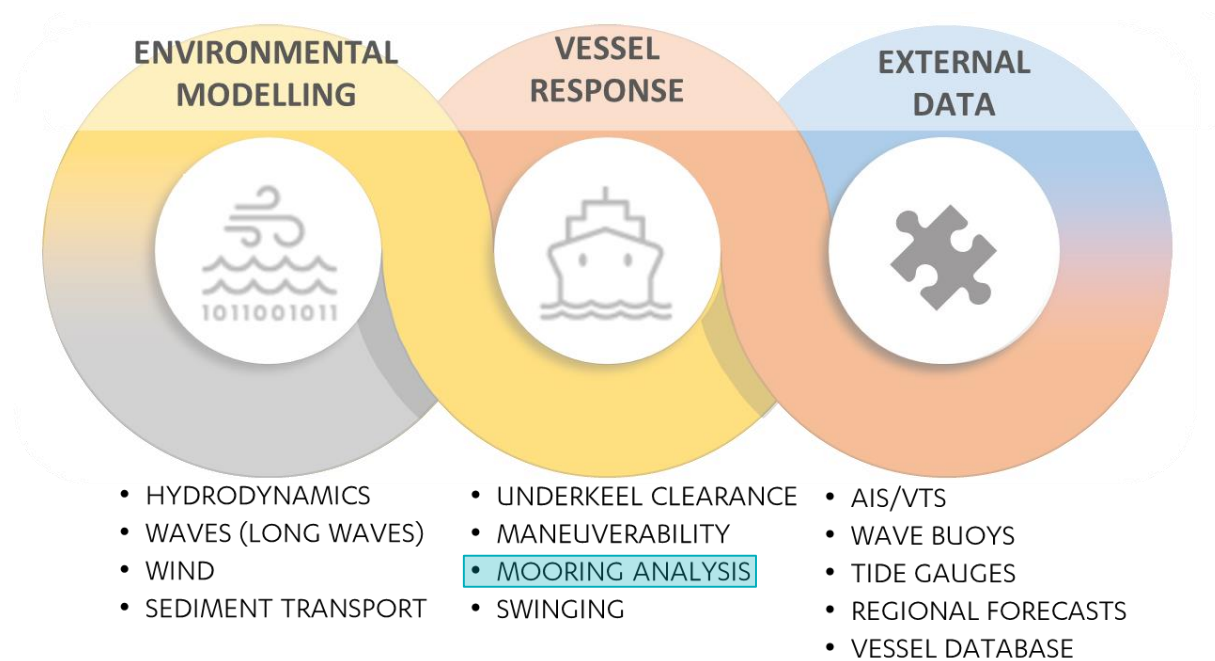
Doing Something About it

Capacity Through Optimized Decision Making

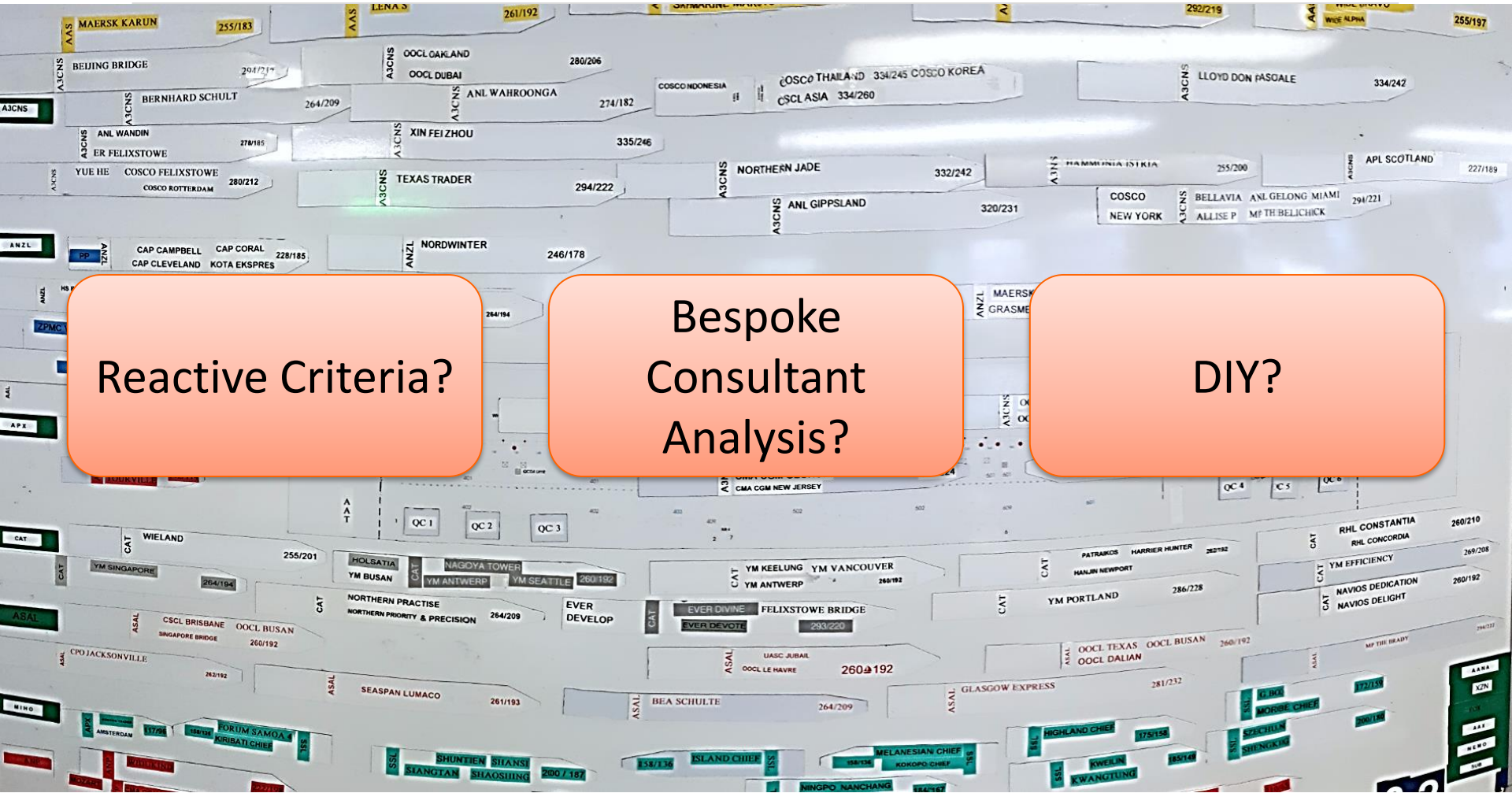


A Smarter Way

The world's most advanced physics based decision support system for ports



The Past



Reactive Criteria?

Bespoke
Consultant
Analysis?

DIY?

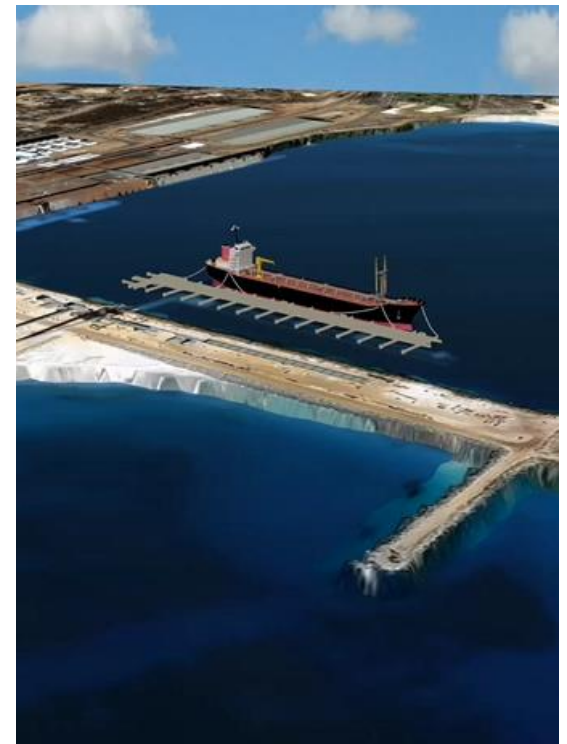
The Next Normal

Proactive | Objective | Automated | Quantitative | Efficient | Accurate

Reactive Criteria?

Bespoke Consultant
Analysis?

DIY?



Vessel Specification

Scenario Name *

AAPA Example

Vessel Name

APL California

IMO No

9350044

Hatch Height Above Main Deck [ft]

4.63

LOA [ft]

962

Beam [ft]

131

Bridge To Bow [ft]

839

Containers High on Deck [tiers]

9

0 16

GMf [ft] *

4

Moulded Depth [ft]

64

Vessel Draft

Draft Value Draft Range

Fore Draft [ft] * Mid Draft [ft] * Aft Draft [ft] *

35 35 35

Displacement [tonnes]

77588.25732

Scenario Id (Click the clip to copy)

SAVE **CANCEL**

Configure Berth

ORIGINAL_USER VPA HPA

Vessel Specification Berth Configuration Environmental Forcings

Go to NIT South Berth 2

Berth: NIT South Berth 2 Berthing Mark [ft]: 250

Mooring Arrangement: 3x2x2 Quayside Starboard

Line Pretension

Line Pretension Value

Line Pretension Range

Line Pretension Value [tonnes]: 10

SAVE CANCEL

HMPE 42 mm Diameter OCIMF Polyamide New

HMPE 42 mm Diameter OCIMF Polyamide New

Environmental Forcing

NCOS Online | ncos.seaportopx.com/ma/mooringanalysis

TERMINAL SCHEDULING | **MOORING ANALYSIS**

ORIGINAL_USER | VPA | HPA

Go to: NIT South Berth 2

Vessel Specification | **Berth Configuration** | Environmental Settings

Berth: NIT South Berth 2 | Berthing Mark [ft]: 250

Mooring Arrangement: 3x2x2 | Quayside | Starboard

Line Pretension

Line Pretension Value

Line Pretension Range

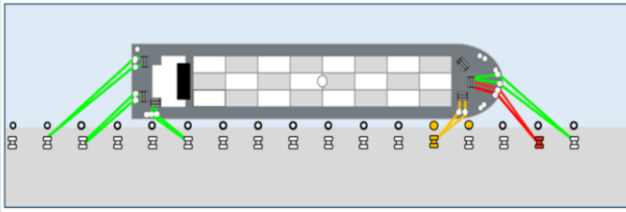
Line Pretension Value [tonnes]: 10

SAVE | CANCEL

Bollard	Fairlead	Line Type	Tail Type
47	7	HMPE 42 mm Diameter	OCIMF Polyamide New
47	8	HMPE 42 mm Diameter	OCIMF Polyamide New
47	9	HMPE 42 mm Diameter	OCIMF Polyamide New
46	10	HMPE 42 mm Diameter	OCIMF Polyamide New

Results

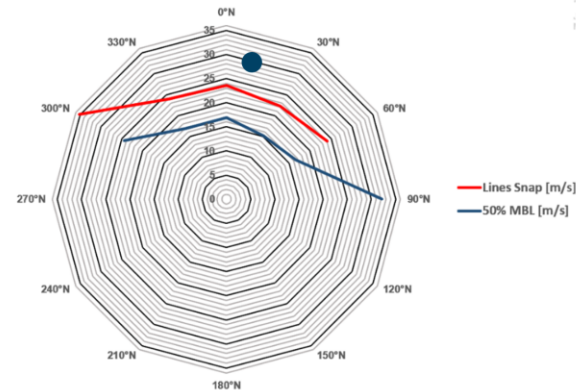
Vessel	
Arrival/Departure	Arrival
Vessel Name	APL California
Port	Port of Virginia
Terminal	NIT Berth 2
DWT	72912
LOA (ft)	962
Beam (ft)	131
Longitudinal Windage Area (m ²)	6500
Lateral Windage Area (m ²)	1000
Draft (ft)	35



Environmental Conditions	
Wind speed (kn)	30
Wind direction (deg)	010
Current speed (kn)	0.5
Current direction (deg)	020
Wave height (m)	-
Wave period (s)	-
Wave direction (deg)	-

Analysis Summary					
Mooring Lines			Fender Failure	Bollard Failure	
50% MBL exceedance	Snapped		L	A	
5	3		M	B	
6	4		M	B	
Maximum P2P Vessel Motions					
Surge (m)	Sway (m)	Roll (°)	Pitch (°)	Heave (m)	Yaw (°)
0.5	0.2	0.2	0.1	0.2	0.3

DIRECTIONAL WIND ROSE



Results



Questions?



Stewards of Tomorrow

