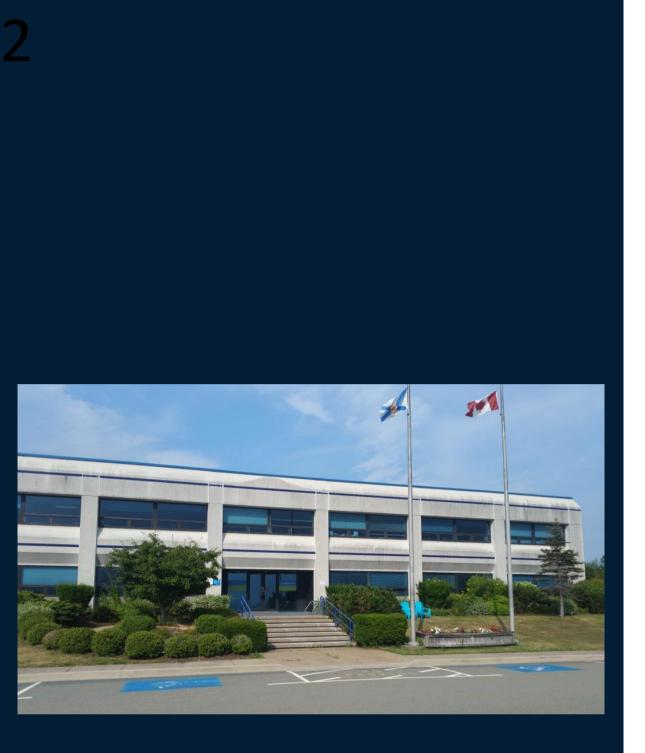
OCIANA AI Platform Maritime Risk and GEOINT Capability Overview

Rob Marshy CTO GSTS Inc. rob.marshy@gsts.ca

May 2022

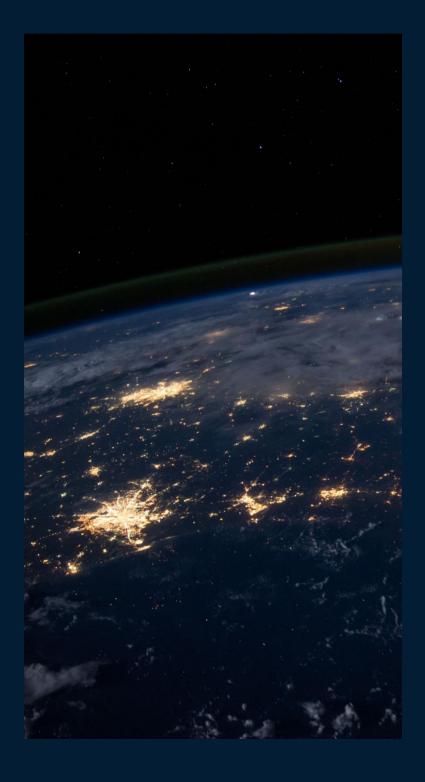
Contains PROPRIETARY information provided in commercial confidence, not for disclosure or dissemination.



GSTS Introduction

- 100% Canadian owned
- Offices in Halifax and Ottawa
- An AI maritime company
- 35 AI data scientists, engineers





Overview

- What is OCIANA?
- **Sample Capabilities**
- **Application Demo**





- Capability Modules \bullet
- Sample Use Cases \bullet

OCIANA: Maritime AI Platform



Integrates multiple streaming data sources



- Extracts patterns



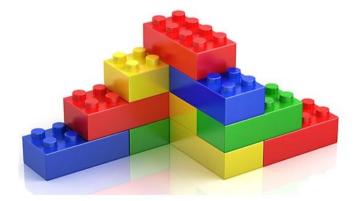
Supports response and coordination



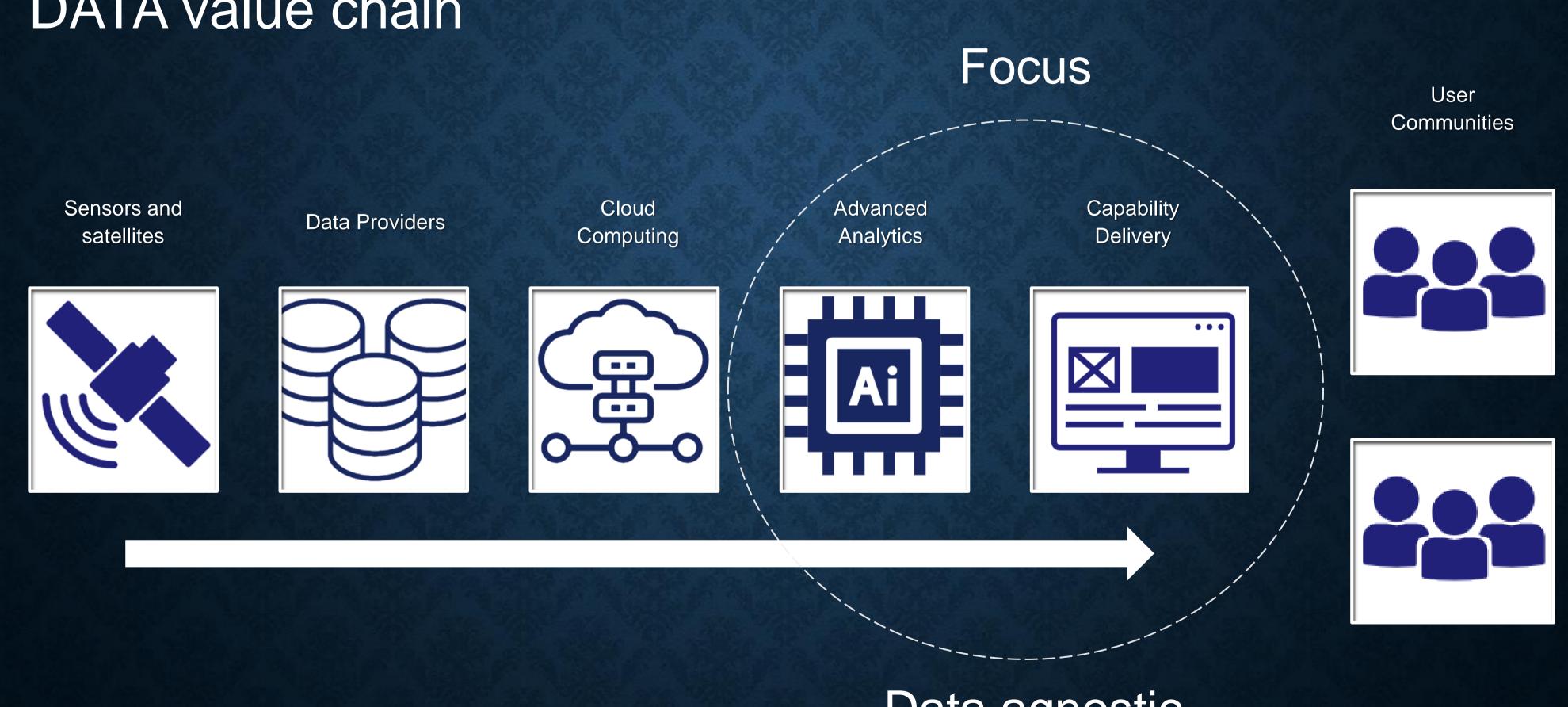
 \rightarrow Modular

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Provides domain awareness and intelligence



DATA value chain





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Data agnostic



In-shore and port patterns



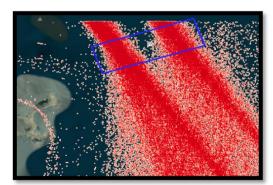
Regulatory Environments

What is OCIANA?

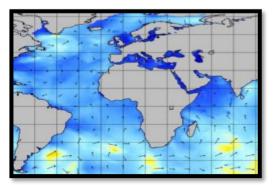
- Capability Modules
- Sample Use Cases



Real-Time Global Data



Vessel Routes and Speeds over time



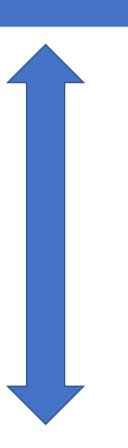
Meteorological Data



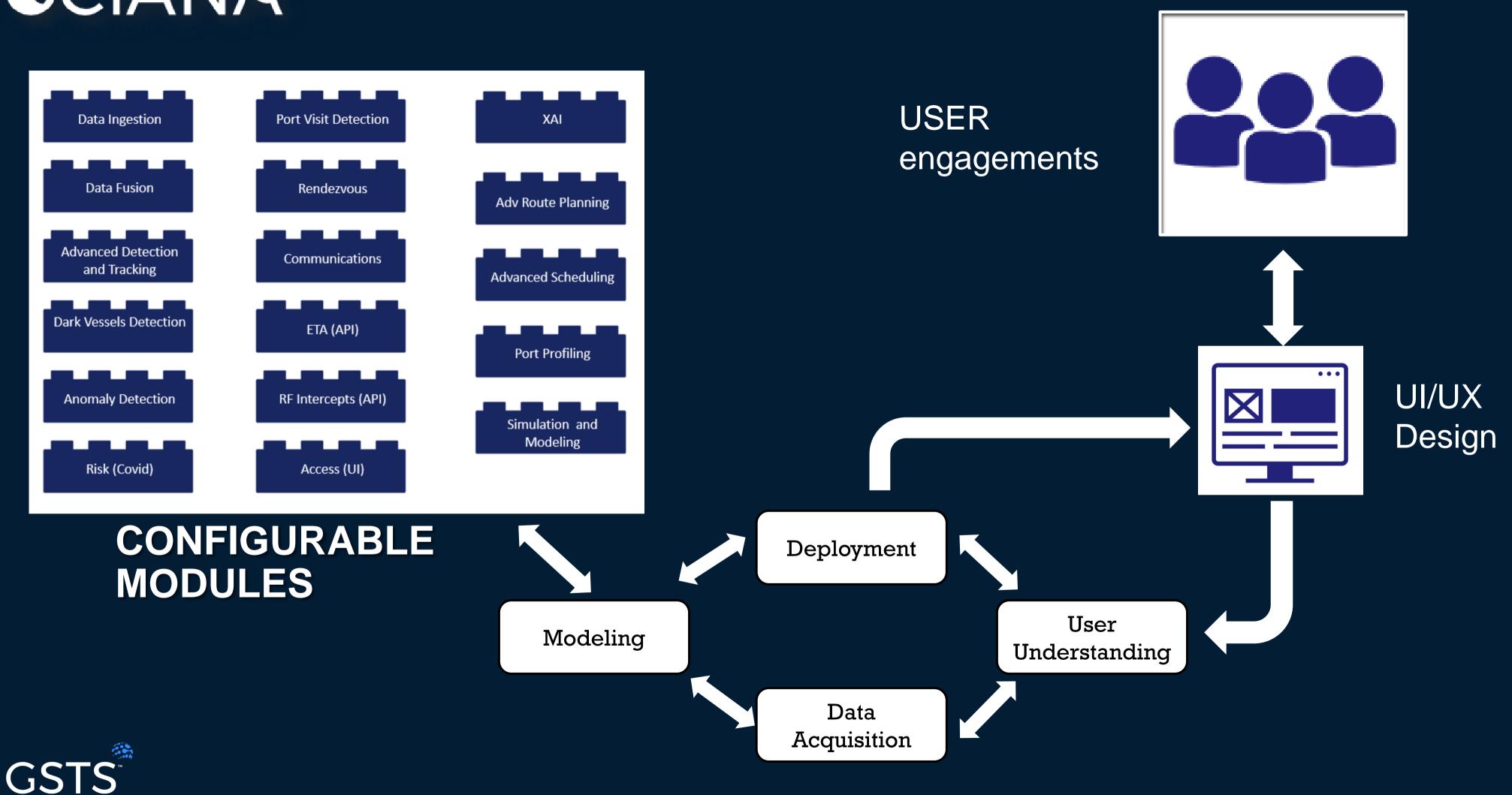
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Risk Management

Algorithms extract patterns and actionable intelligence



Vessel Management



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User Contributions to OCIANA

>40 User Sessions

>300 User Feedback Elements

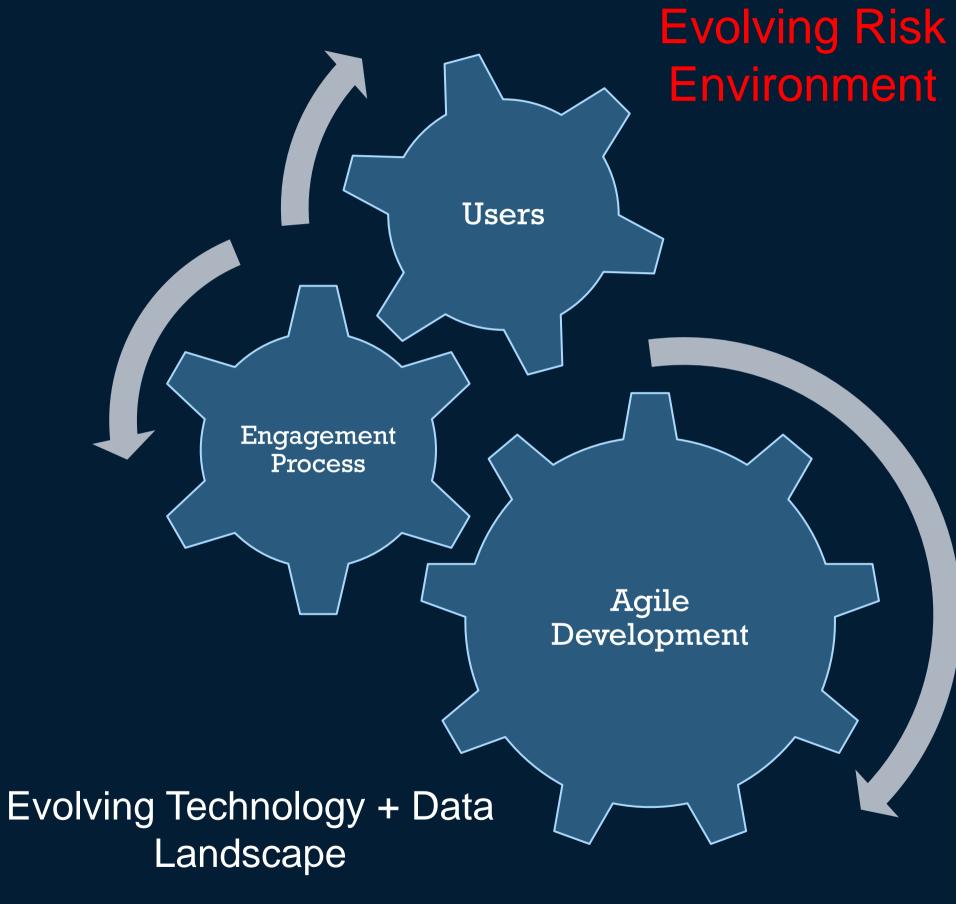






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COLLABORATIVE DEVELOPMENT





User-centric data engineering:

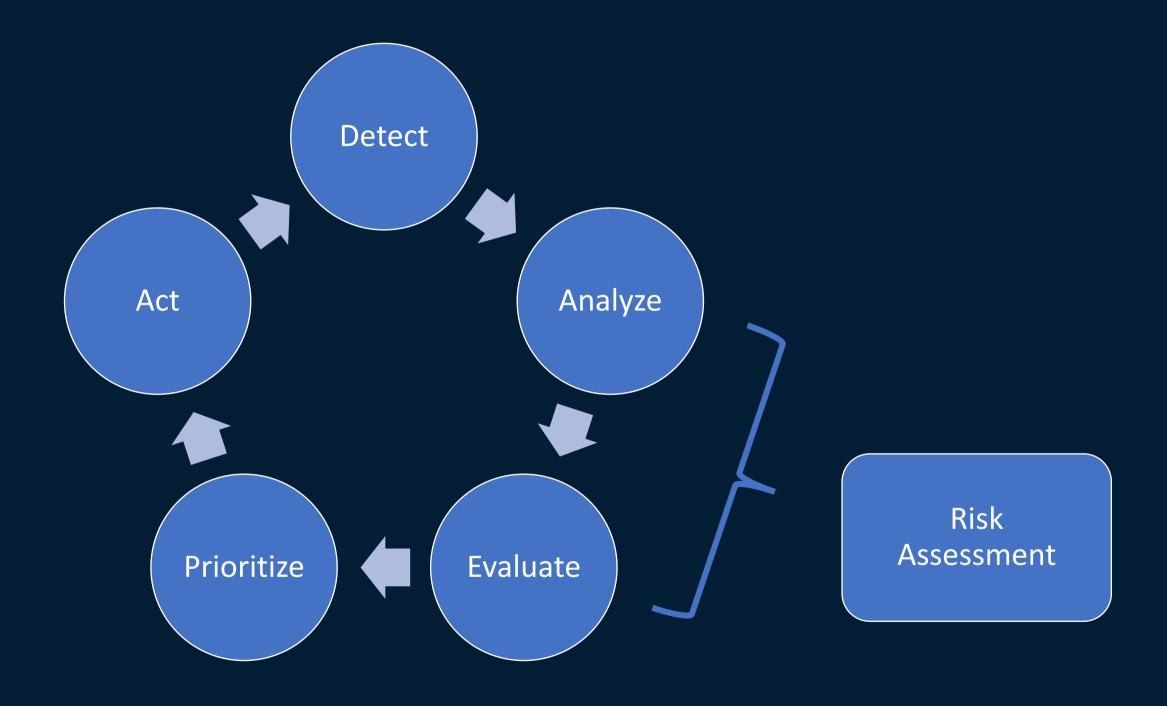
- Trustable data \rightarrow actionable intelligence
- Modular + Scalable
- Match data to the changing needs
- User Engagement teams

RISK: How might we effectively handle risk?



Capability Modules

• Sample Use Cases



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OCIANA[®]

Sample module capability



- What is OCIANA? \bullet
- Capability Modules
- Sample Use Cases

Maritime Domain Awareness with Intelligent Risk Detection

National Security Risks

- Illegal cargo
- Criminal crew or passengers
- Espionage or illegal acts

Regulatory Risks

- Vessel Flag State, ownership, port visits
- History of non-compliance
- Dangerous cargo

Legal and Commercial Risks

- Prohibited imports
- Organized criminal activity
- Illegal fishing or mining









RISK: How can we effectively assess risk?

• What is OCIANA?

Capability Modules

• Sample Use Cases

Data Space

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Anomalies

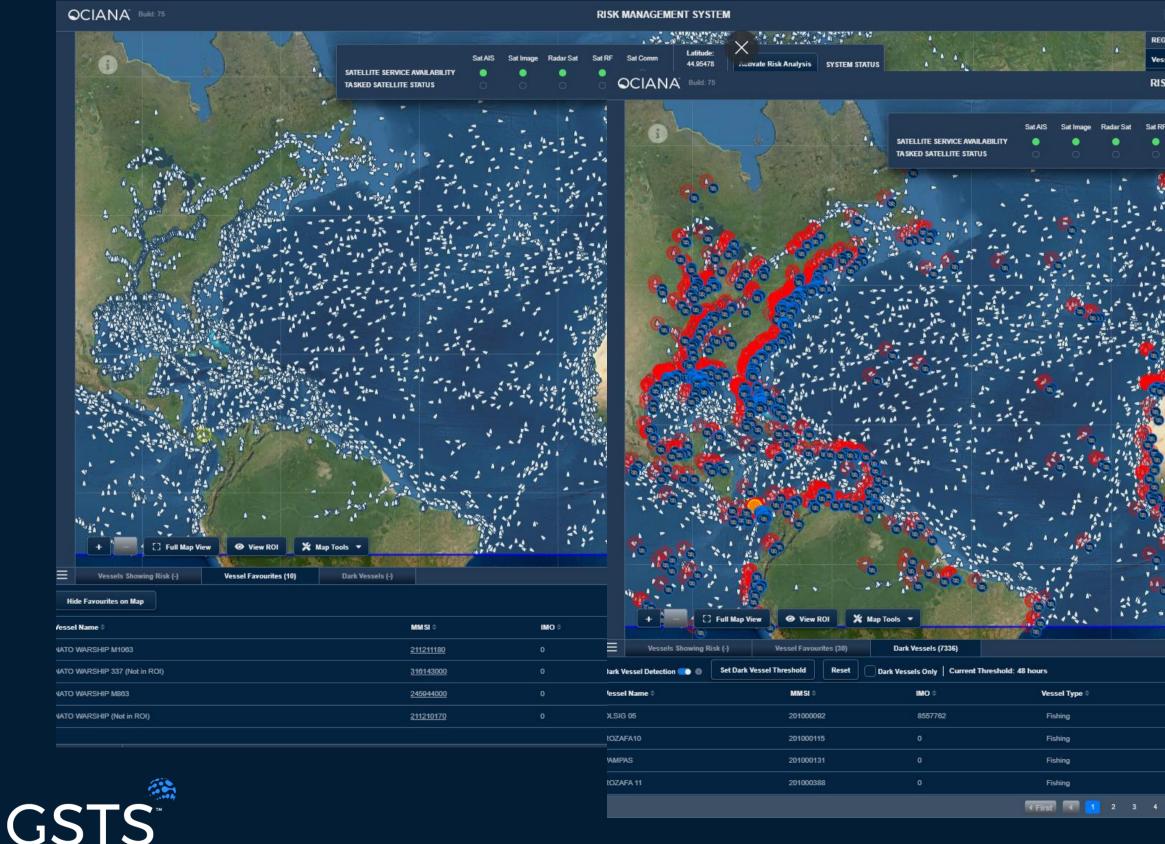
Behavioural Pattern Anomalies

Risks

In the eye of the beholder

Data Darkness - the "unknown unknowns"

When it looks like you can see everything...



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but you're not seeing 7336 Dark Vessels

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REGION SUMMARY								
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	Time of Vessel Going Dark 🖗	Duration of Vessel Being	Dark (hours) 🖗	30 Nov 2021 21:42:46 Z	Low	7336 dark ves hours.	isels detected fo	r at least 48
	25 Nov 2021 08:07:01 Z	133.6						
	26 Nov 2021 03:09:44 Z	114.6		30 Nov 2021 21:42:26 Z	Cow	No update to	be made at this	time
	21 Nov 2021 19:02:19 Z	218.7		30 Nov 2021		9995 dark ver	isels detected fo	r at least 24
	28 Nov 2021 07:06:48 Z	62.6		21:42:23 Z	Low	hours.		
4 5 ▶ Last ▶ 1 d	of 734			30 Nov 2021	Low	7 vessels fou	nd containing "tr	opical" in

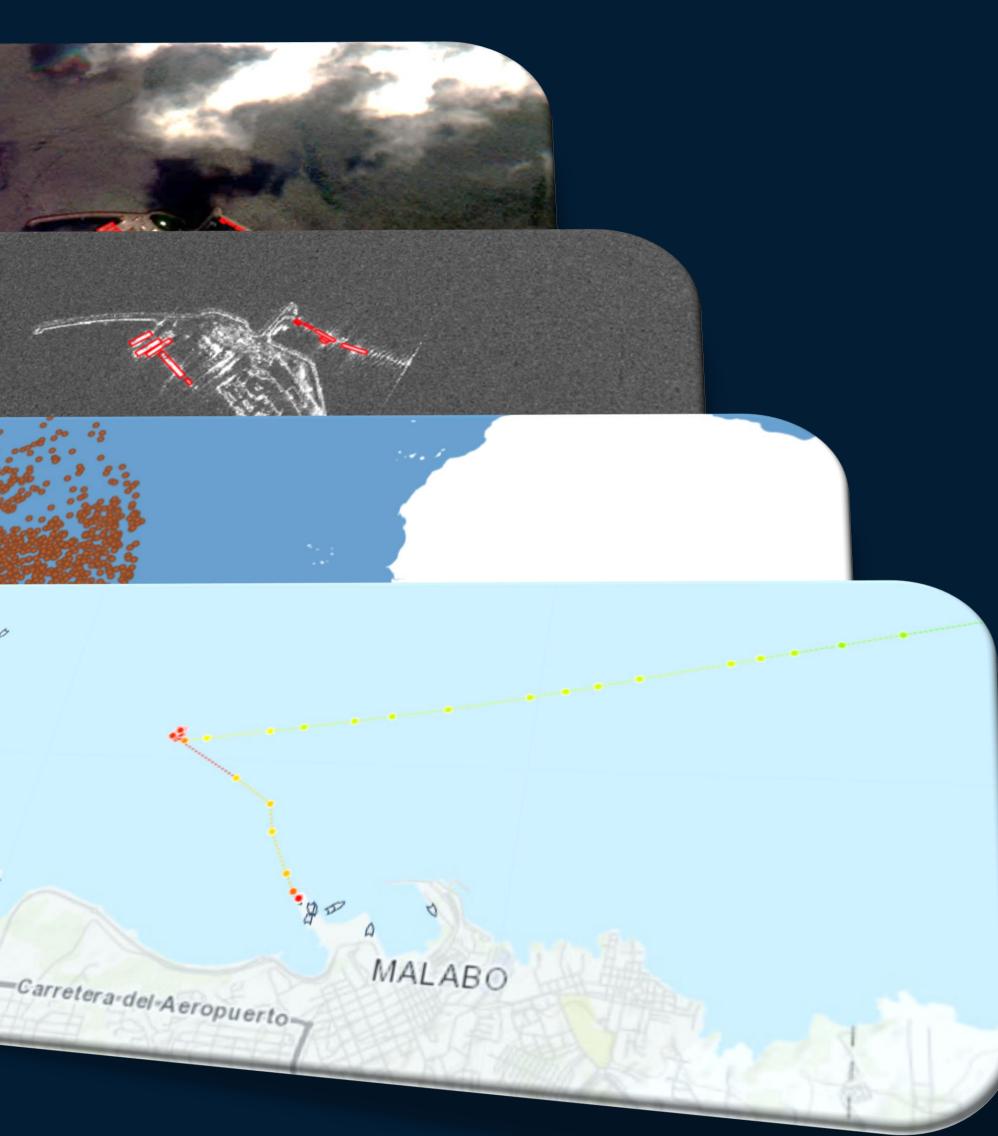
USE CASE: Dark ship

DATA DIVERSITY



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D



- What is OCIANA?
- Capability Modules

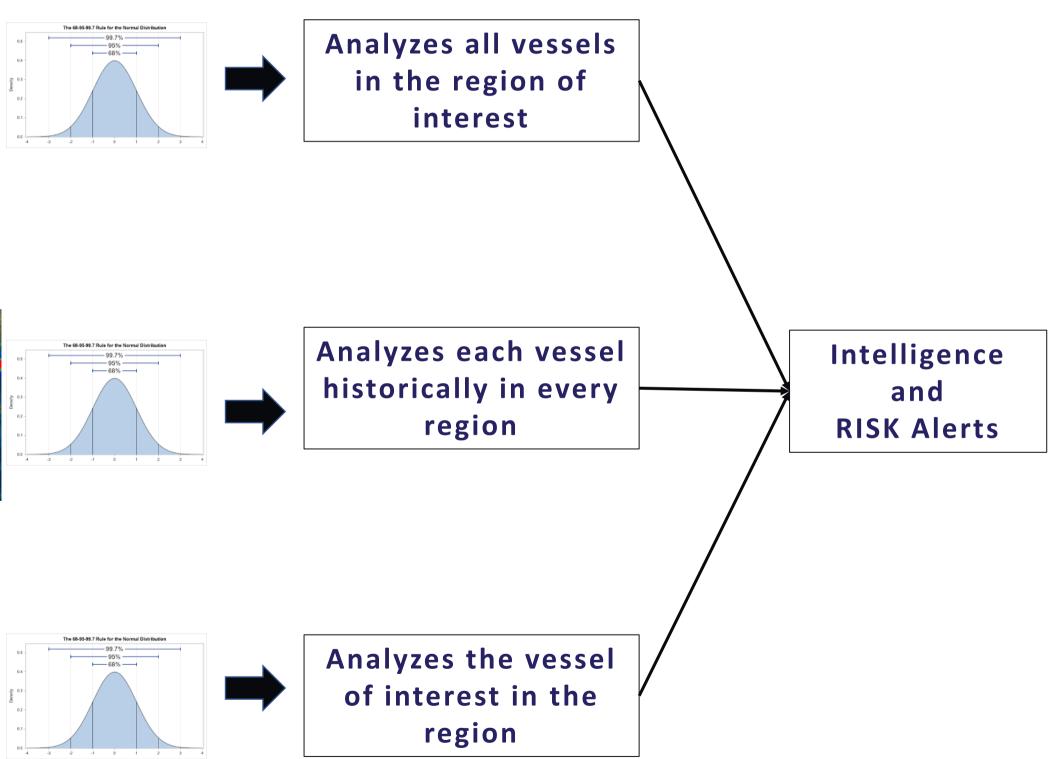
Sample Use Cases

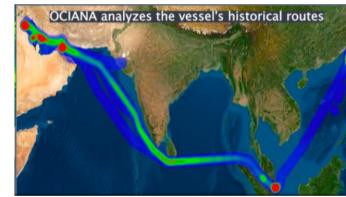
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_	Parameter or attribute:	target size extent (m)	vessel ID data	AIS TX state	stated AIS status (if any)	trajector y profile	SOG profile	COG variation	Rate of Turn <= deg/min	relative to sea lanes	zones	coastal proximity nm	arrival area	departur e area	last n days of proximal contacts (RVs)	time of day	Sea State	season	sea current	wind kts	depth m
	1	0-5	no data	always on	underway	tracporting	clow 0-6	straight	0	'n	anchorage	up to 2	terminal	terninal	0 to 1	morning	low	sping	0 to 0.5	0 to 5	challow Sm
	2	6 to 10	consistent	ahrays off	anchor	forry	med 7-15	undulating	low	out	port	up to S	port	port	1 to 2	mid	med or <	same	.6 to 1	5 to 10	6-10m
	3	11 to 30	folze data	now off	no-command	tractipesat	fact 16>	errstic	nod	crozzing	waterwaye	up to 12	son-port	nos-port	2 to 4	ovening	high or <	fall	1 to 2	10 to 20	11-30m
_	4		ID transients	irregular	restricted	random	erratic	repeat pattern	high	agaiest	protected	12+	nos-port challow	non-port challow	5 or more	night	v high or <	winter	>2	20 to 40	open sea
_	5	100>	nianotch		other	potrol	337	sey	307	149	opin	**7	sey	339	sey	307	149	949	397	569	339
	6	Not_App	Not_App	Not_App	NotApp	Not_App	Not_App	Not_App	Not_App	Not_App	any	Not_App	Not_App	Not_App	Not_App	Not_App	Not_App	Not_App	Not_App	Not_App	Not_App
	7	Userail	Unovoil	lieveeU	Unoreil	Ussvail	Userail	Unovoil	Userail	Unovoil	Usavail	Unorsil	Usovail	Userail	Usovsil	Usurail	Unovoil	lieveeU	Uesnail	Usovsil	Userail
general risk of grounding; predicting imminum grounding; vecral kas already run aground	Grounding risk of grounding grounding imminent has run aground	2,3,4,5	6	6	6	6	1	1	1	2	6	1	5	5	5	5	5	5	5	5	
The mother ship curries one or more small shifts	Piracy small boat (skilf) mother ship	2 3,4	3 3,4,5	2 4	6 1,2,7	4 3,4	4 5	3 5	4 5	5 5	2,3,4,5 2,3,4,5	5 5	2,3 2,3	7 2,3	4 3,4	5 5	1,2 1,2,3	5 5	5 1,2,3	1,2,3 1,2,3	5 5
In the case of a large nessel, the immigration may be a stow way and undetectable.	llegal immigration small boat medium boat large vessel	1,2,3 3,4 5	1 3 4	:	7 1 1,2	:	2,3 1,2,3,4 5	1,3 5 5	5 5 5	5 5 1	6 2,3,4,5 1,2,3,5	3 5 4	2,3,4 3,4 1,2,3,4	2,3,4 3,4 3,4	3,4 2,3,4 4	1,3,4 5 1,3,4	1,2 1,2,3 1,2	5 5 5	1,2,3 5 5	1,2,3 1,2,3,4, 1,2,3	5 2.3.4 3.4
Thic behaviour is generalized to be the same for any contraband item	Smuggling small boat medium boat large vessel	1,2,3 3,4 5	1 3 4	-	7 1 1,2	:	2,3 1,2,3,4 5	1,3 5 5	5 5 5	5 5 1	6 2,3,4,5 1,2,3,5	3 5 4	2,3,4 3,4 1,2,3,4	2,3,4 3,4 3,4	3,4 2,3,4 4	1,3,4 5 1,3,4	1,2 1,2,3 1,2	5 5 5	1,2,3 5 5	1,2,3 1,2,3,4, 1,2,3	5 2,3,4 3,4
ſ	ncident / accident Fire: large vessel at sea	5	6	6	4	4	1,4	3	5	5	3,4,5	5	1,2	1,2	5	5	5	5	5	5	3,4
This behaviour is generalized to be the same as smuggling; same for any contraband hem	Frafficking	1,2,3 3,4 5	1 3 4	:	7 1 1,2	:	2,3 1,2,3,4 5	1,3 5 5	5 5 5	5 5 1	6 2,3,4,5 1,2,3,5	3 5 4	2,3,4 3,4 1,2,3,4	2,3,4 3,4 3,4	3,4 2,3,4 4	1,3,4 5 1,3,4	1,2 1,2,3 1,2	5 5 5	1,2,3 5 5	1,2,3 1,2,3,4 1,2,3	5 2,3,4 3,4
TBD; Matt and Dhinya (see also vessel behaviour portroit for traviling)	llegal Fishing																				
The following are "good" intention	activities which we can train fa	ır more cəsil	7 (kopefally l	lots of exam	ples) and	se to differ	ntiate from	the "bad" in	tention baka	riours. So if	it matches o	ne of these r	ery strongly,	, then it show	ld be less lik	iely involved	in one of th	e above.			
Normal at-cea voyage of a veccel transiting from point A to point B, usually done to minimize cost and/or time	n Transit med large	4 5	2		:	1	2,3 2,3	1	1,2 1,2	1	1,2,3 1,2,3	•	1,2 1,2	1,2 1,2	1,2,3,4	5 5	1.2.3 5	5	5	5	2.3.4 3.4
	Transit-type vessel at med		2		2	6	1	2	2	2		2	3	3	1,2,3,4	5	1,2,3	s	5	5	2,3,4
	arge Ferrying (Passenger)	5	2	1	2	6	1	2	2	2	1	2	3	3	1,2,3	5	5	5	5	5	3,4
· · · · · ·	renous reassengeri		_																		

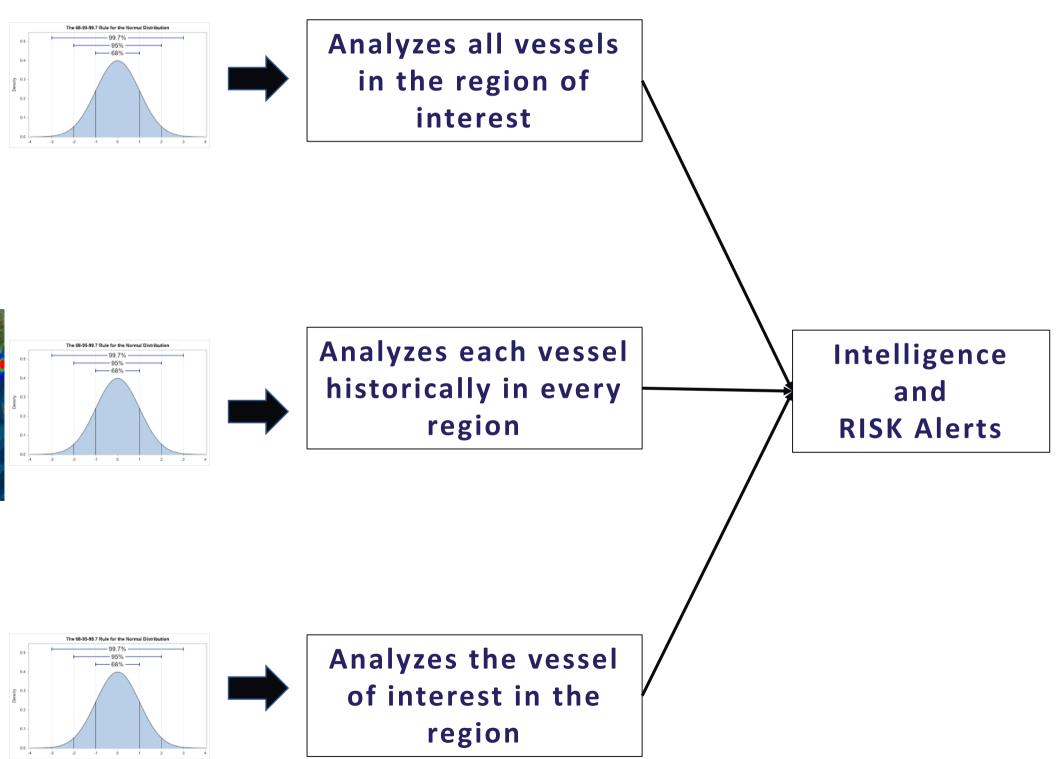


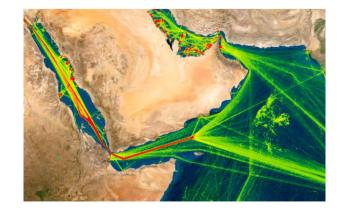
Use Case: Analyzes "Patterns of Life" to reveal risk probabilities

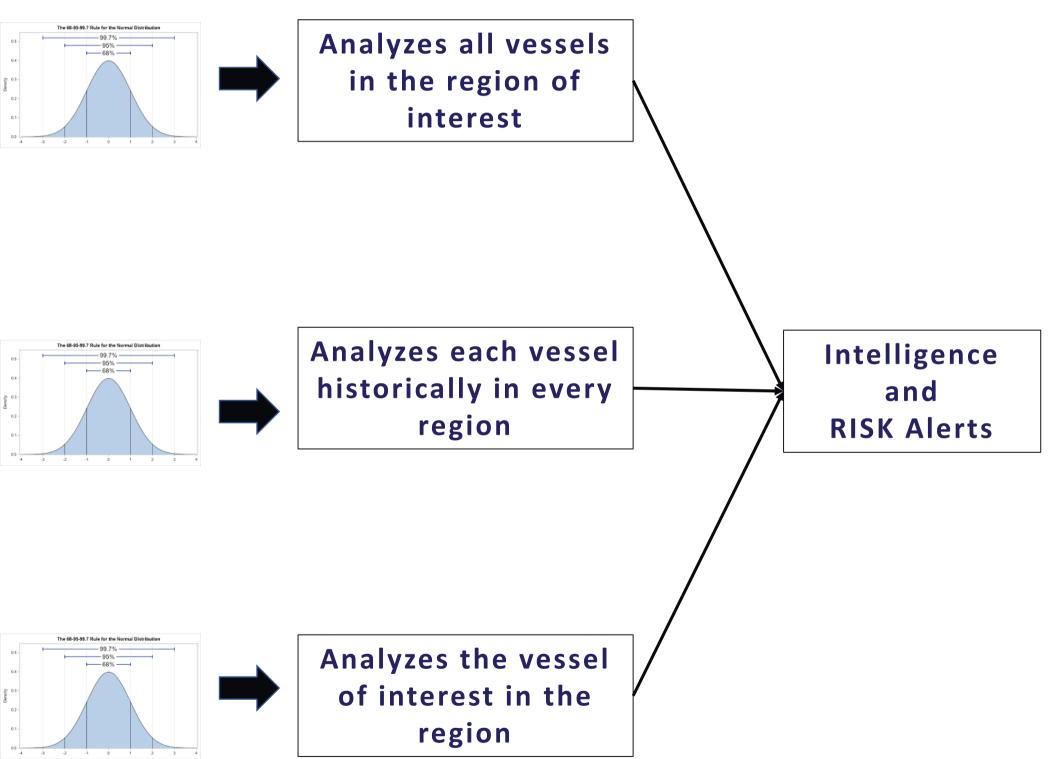












Sample module capability

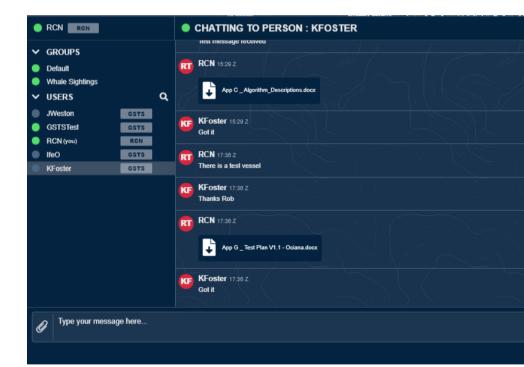


- What is OCIANA?
- Capability Modules
- Sample Use Cases

Communication and Collaboration

CHAT:

Communicate with own or other organization; send and receive files







×

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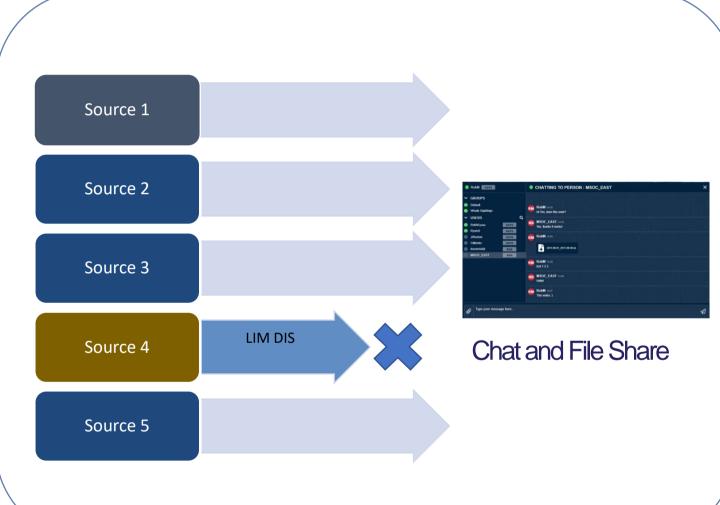
OCIANA[®]

Coordinate Responses With National Partners

- What is OCIANA? \bullet
- Capability Modules \bullet

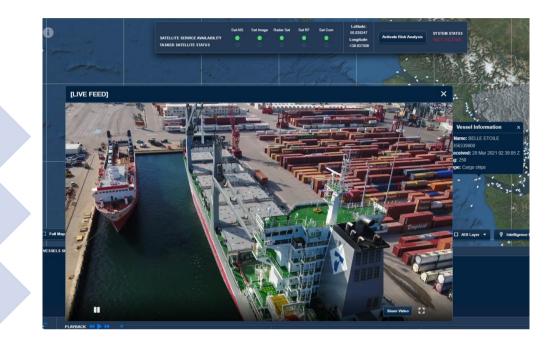
Sample Use Cases

Built-in communication and data sharing, including video





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Drone Video Share



Sample module capability



- What is OCIANA?
- Capability Modules

Sample Use Cases

Access (UI)





Application

Maritime situational awareness tool that provides analytical, communication, scenario, and visualization capabilities



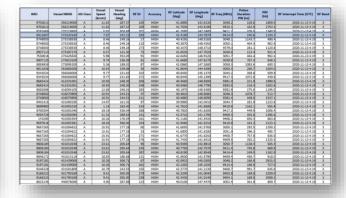


Interactive visual information tool that provides insights to assist with informed decision making





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Intel Data for the use in DBs, analytical modelling and situational analysis (via API)



Static visual information artifact that provides insights to assist with informed decision making



OCIANA Platform





Overview

- What is OCIANA?
- **Sample Capabilities**



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