UDT
Undersea Defence Technology
13-15 May 2019
Stockholmsmässan, Sweden

Sciamano Concept Study

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Consultant

c/o

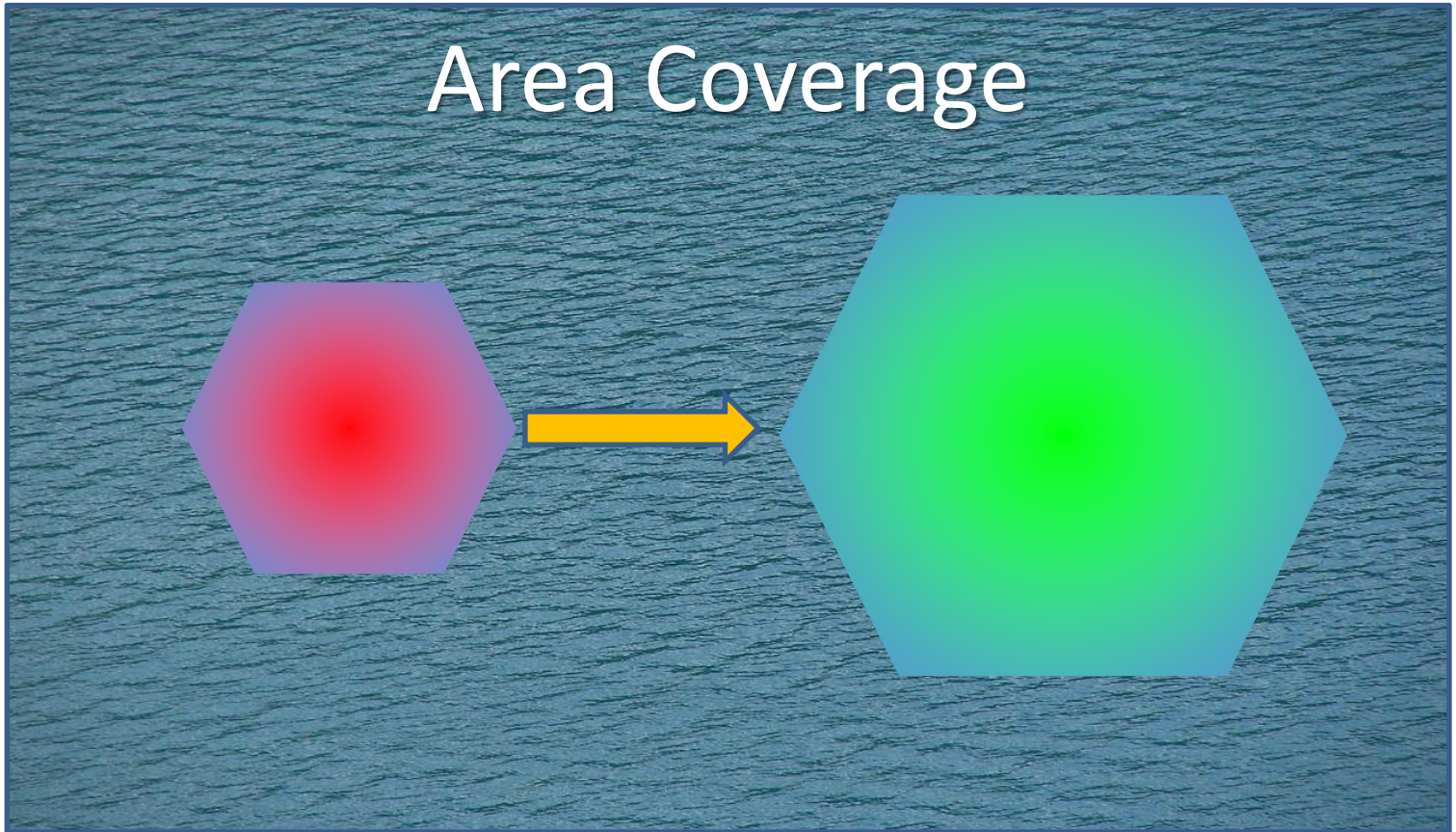
Fincantieri – Naval Vessel Division

Risk

• Loss of Naval Asset
• Loss of Personnel
• Decreased Force's Operational Effectiveness
• Media highlight → Political Impact

Aim

Aim (possibly…)



Current Anti-Torpedo Options

- Avoid detection
  - Acoustic Signature
  - Away from PROBAREAs
- Detect the submarine
  - Stand-off detection and localization
  - Adequate classification
- Torpedo Defense
  - Soft-kill
  - Hard-kill

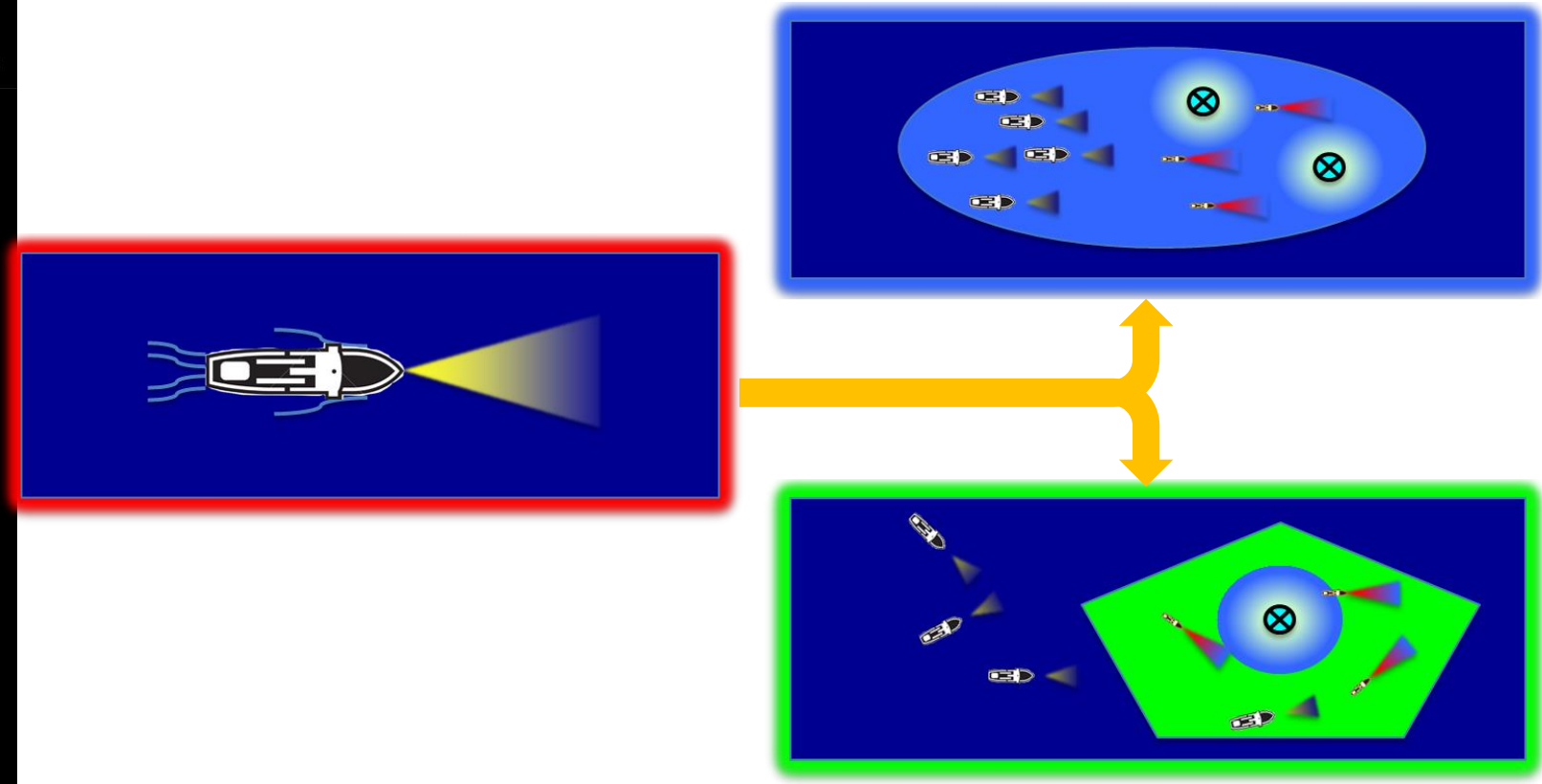
Mix / Selection

Current Mine Countermeasures Options

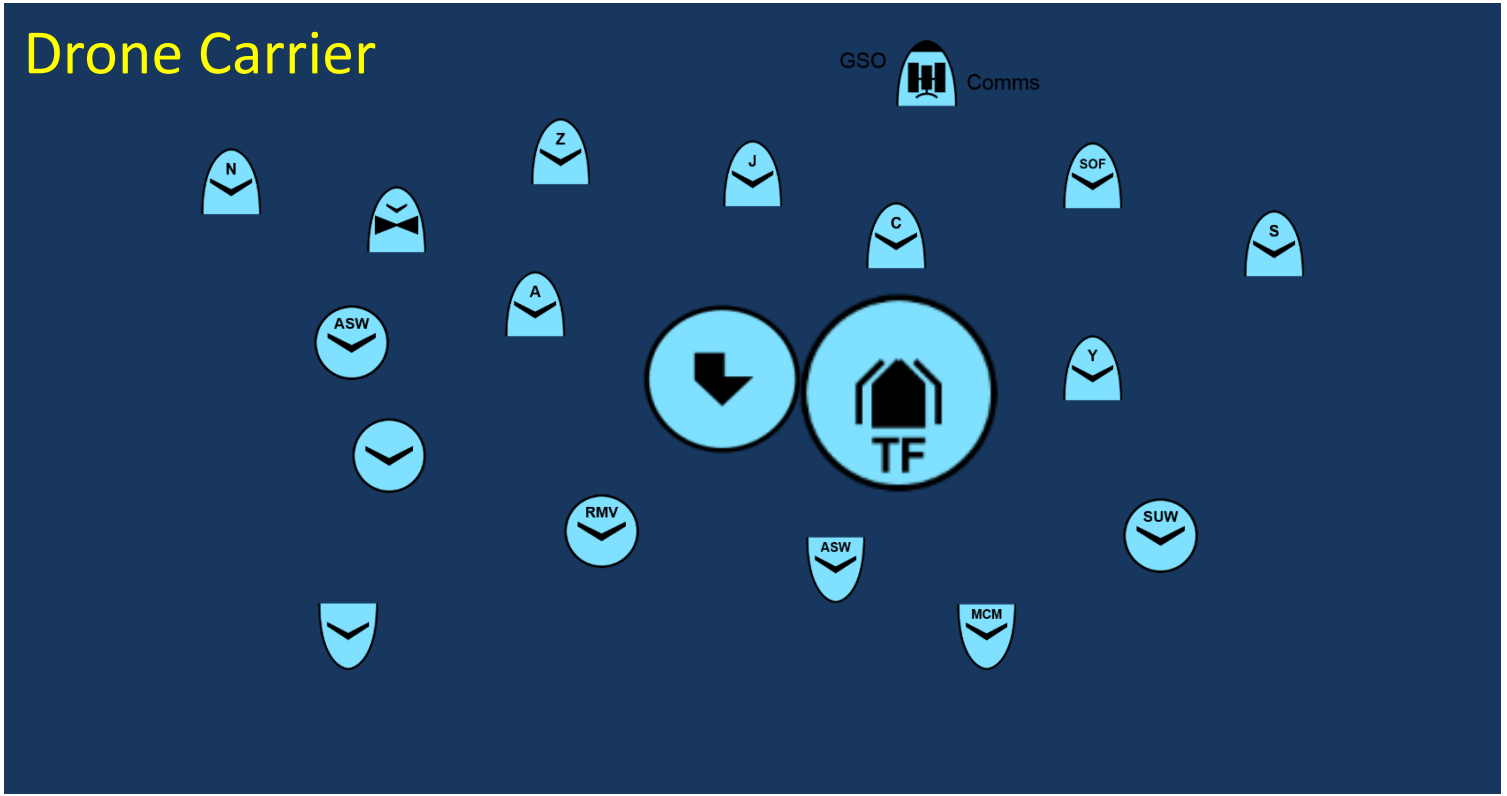
- Avoid detection/activation
  - Acoustic/Magnetic/Pressure Signature
- Avoid the mine
  - Away from MDAs
  - Mine Avoidance Systems
- Detect the mine
  - MCMVs
  - AUVs

Mix / Selection

Concept



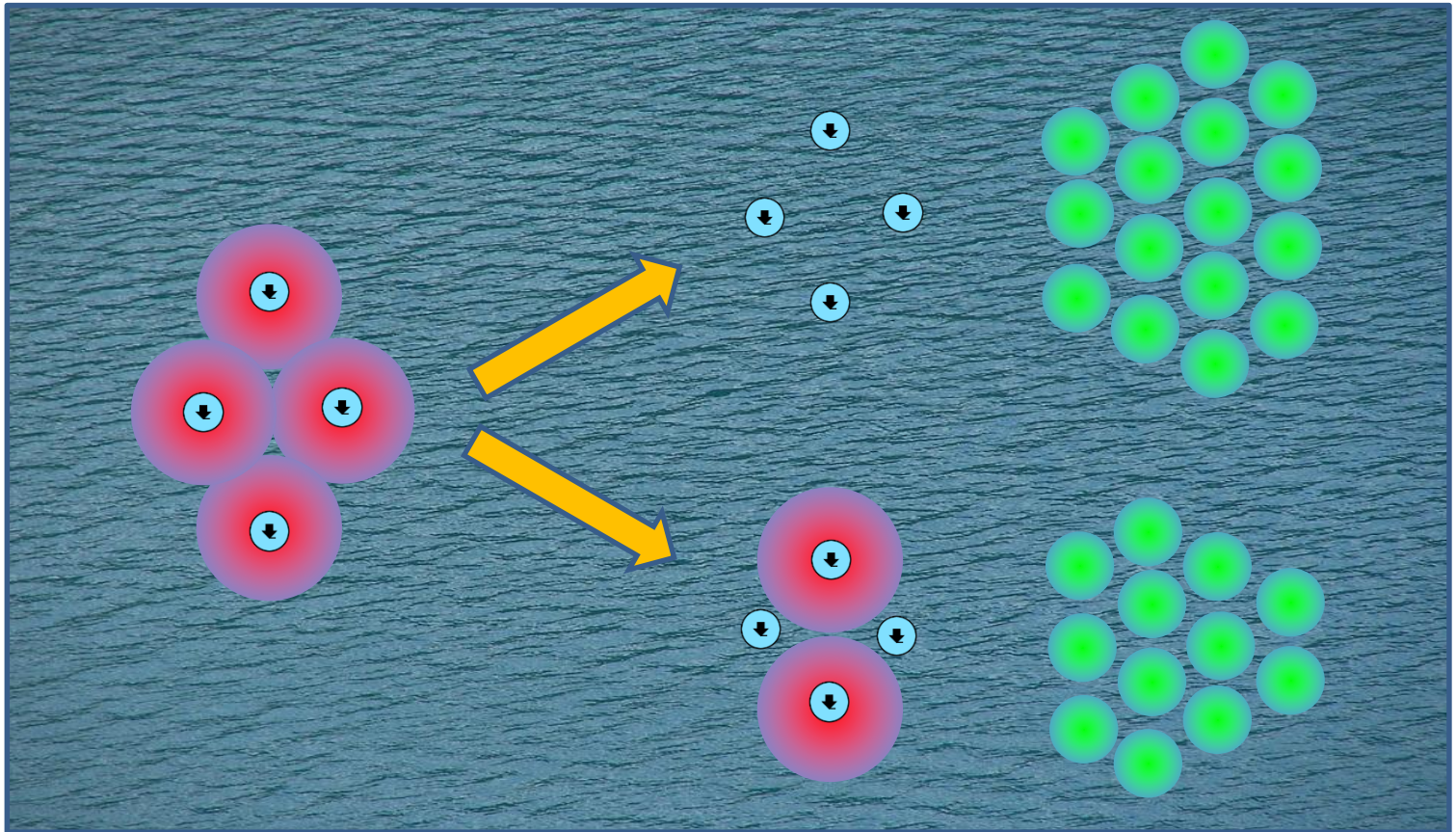
Swarm



Sciamano

English
Italian
Swarm
Sciame
They swarm
Sciàmano
Shaman
Sciamàno

Area Coverage - Alternatives



Study Approach

1. Estimate concept effectiveness, based on performances of unmanned vehicles currently on the market, or being developed

   Indicate if the concept is likely to be mature/effective in the near term, or the current gap with traditional solutions

2. Estimate unmanned vehicles' characteristics required to make the concept worth to be pursued in medium / long term

   Drive unmanned vehicles producers' R&T to the development of future systems

Timeline and Highlights

Start:	September 2018
Foreseen Duration:	6 to 9 months
Main Focus:	Undersea Domain
	ASW
	MW
Additional Focus:	Other Warfare Areas
	Peacetime Operations

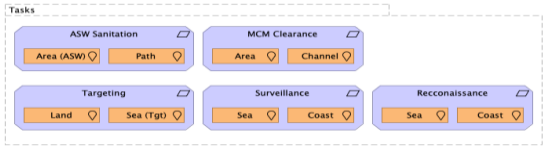
Whole Warship Approach - Details

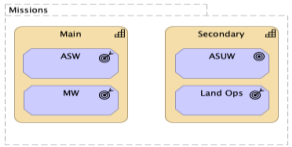
Tasks

Requirements

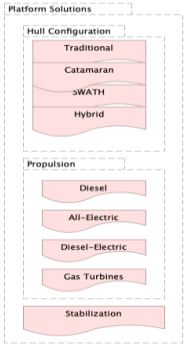
Combat System

Analysis

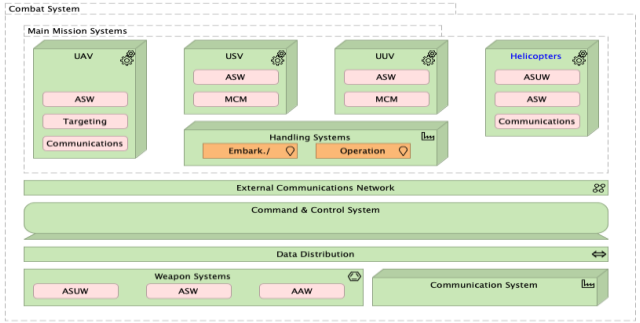


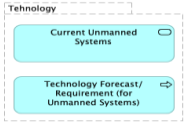


Missions

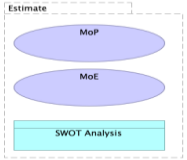


Platform



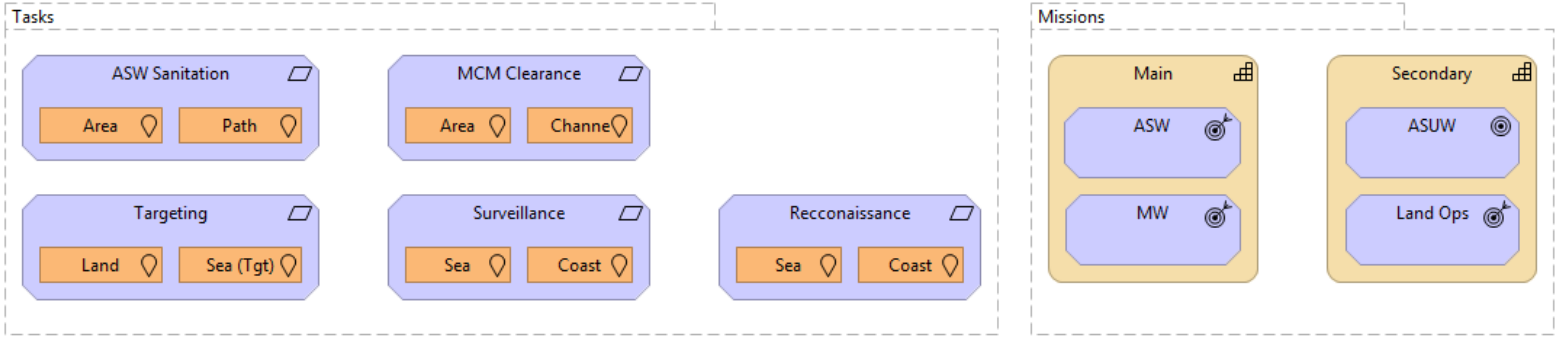


Technology

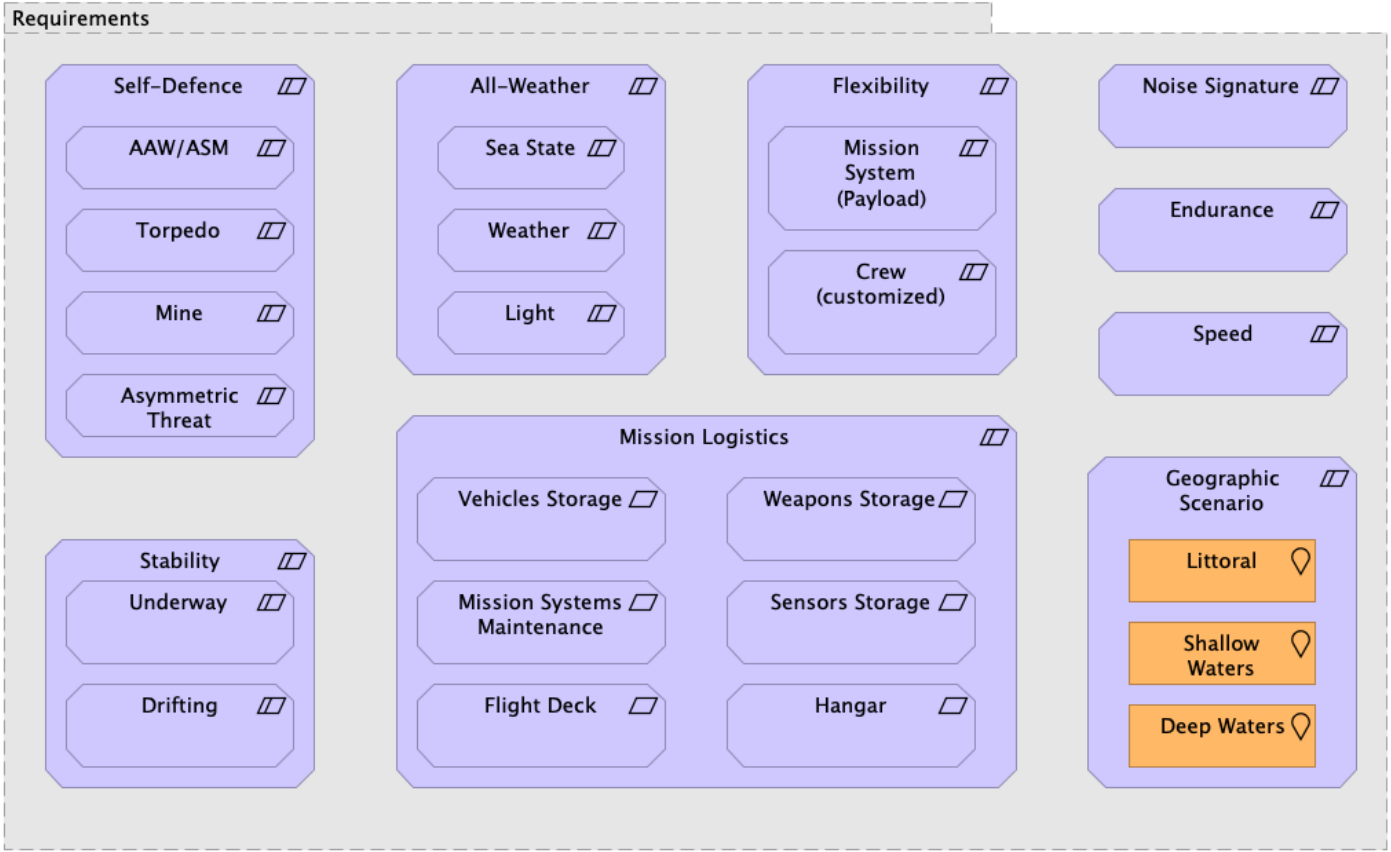


Estimate

Ship's Tasks and Missions



Operational Requirements



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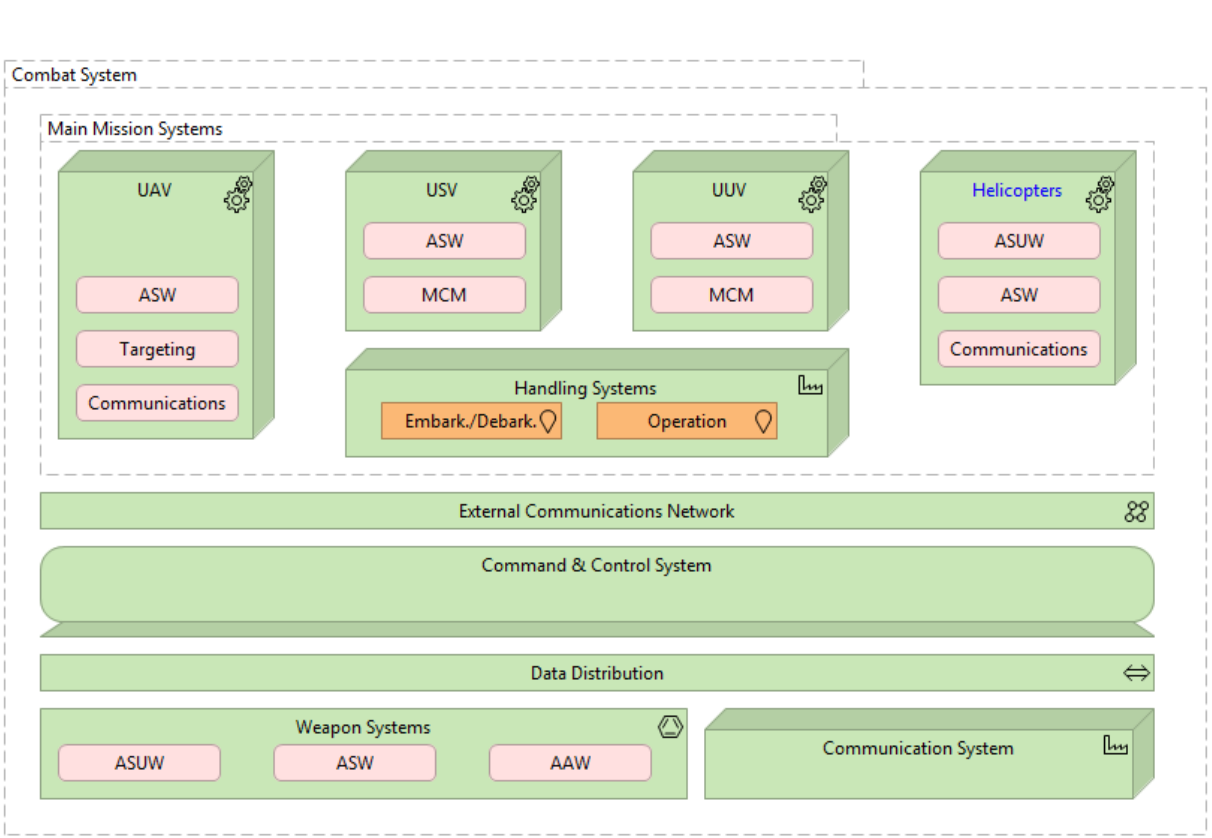
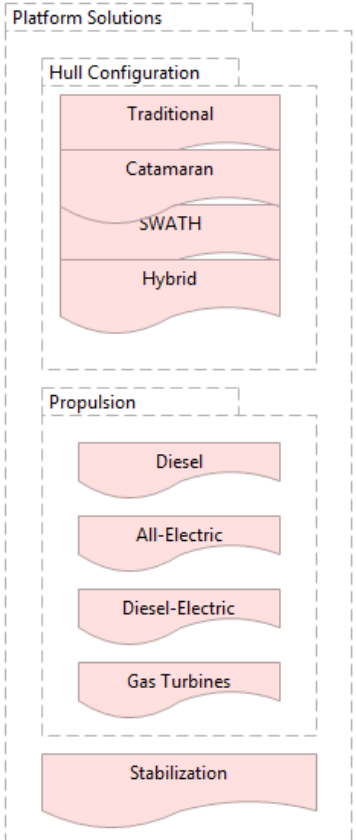
Combat System & Platform Solutions





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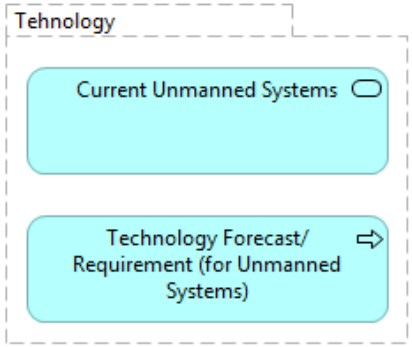
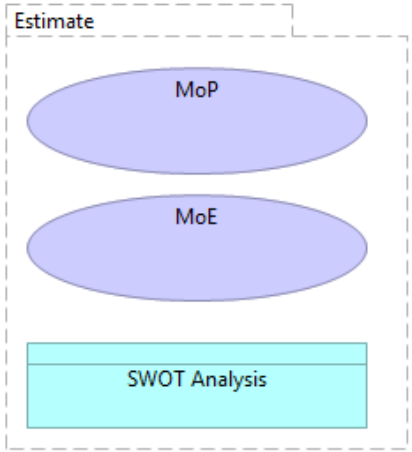
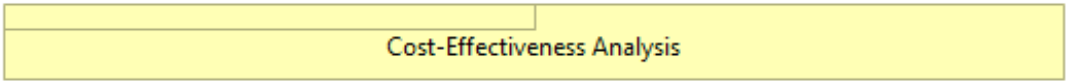
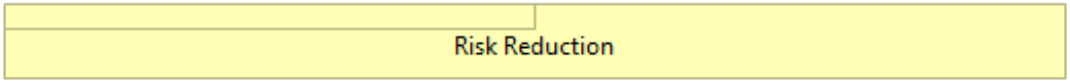
Estimate, Forecast & Analysis









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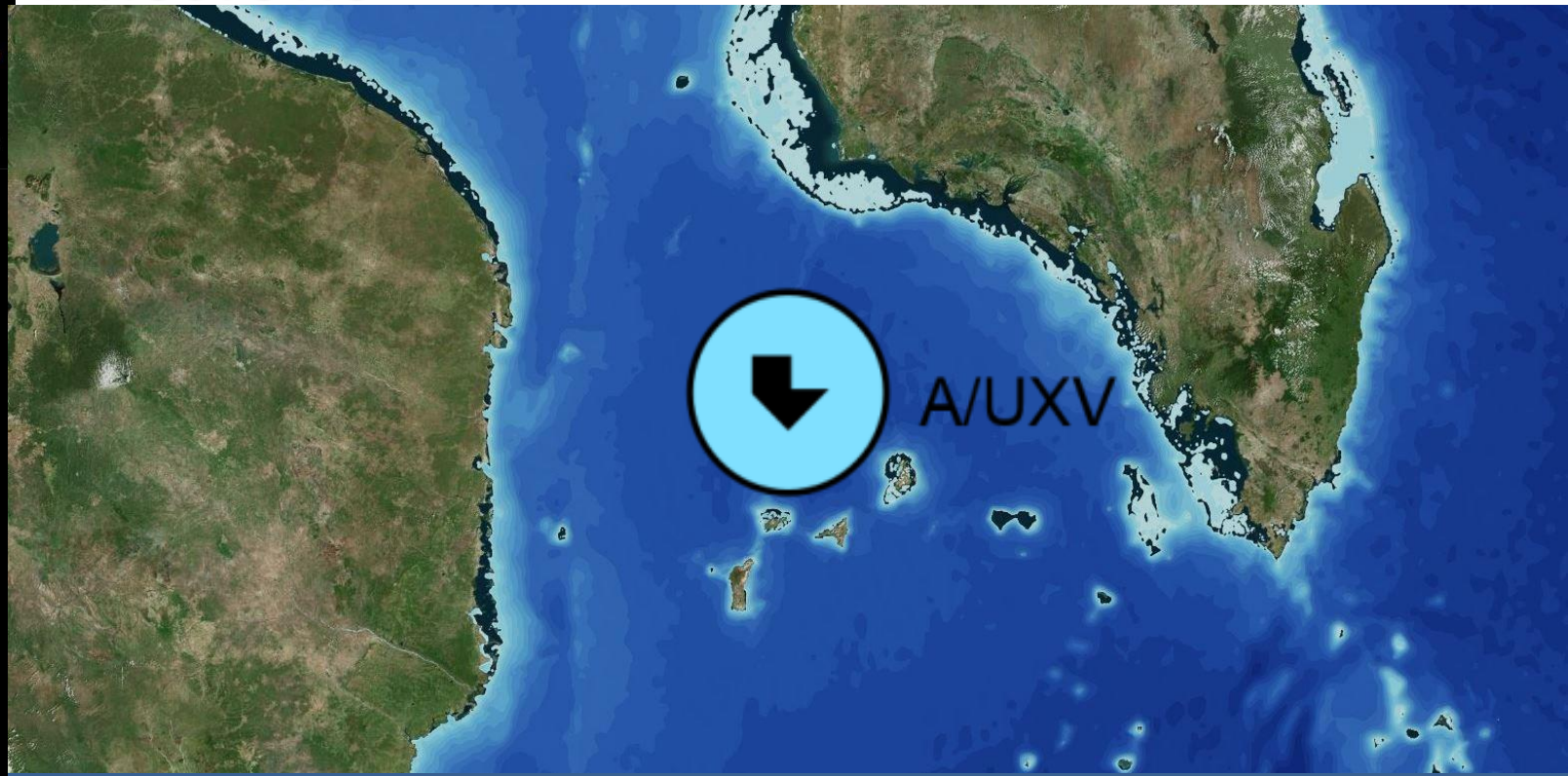
Missions



AUV/UUV/USV Carrier (A/UXV)

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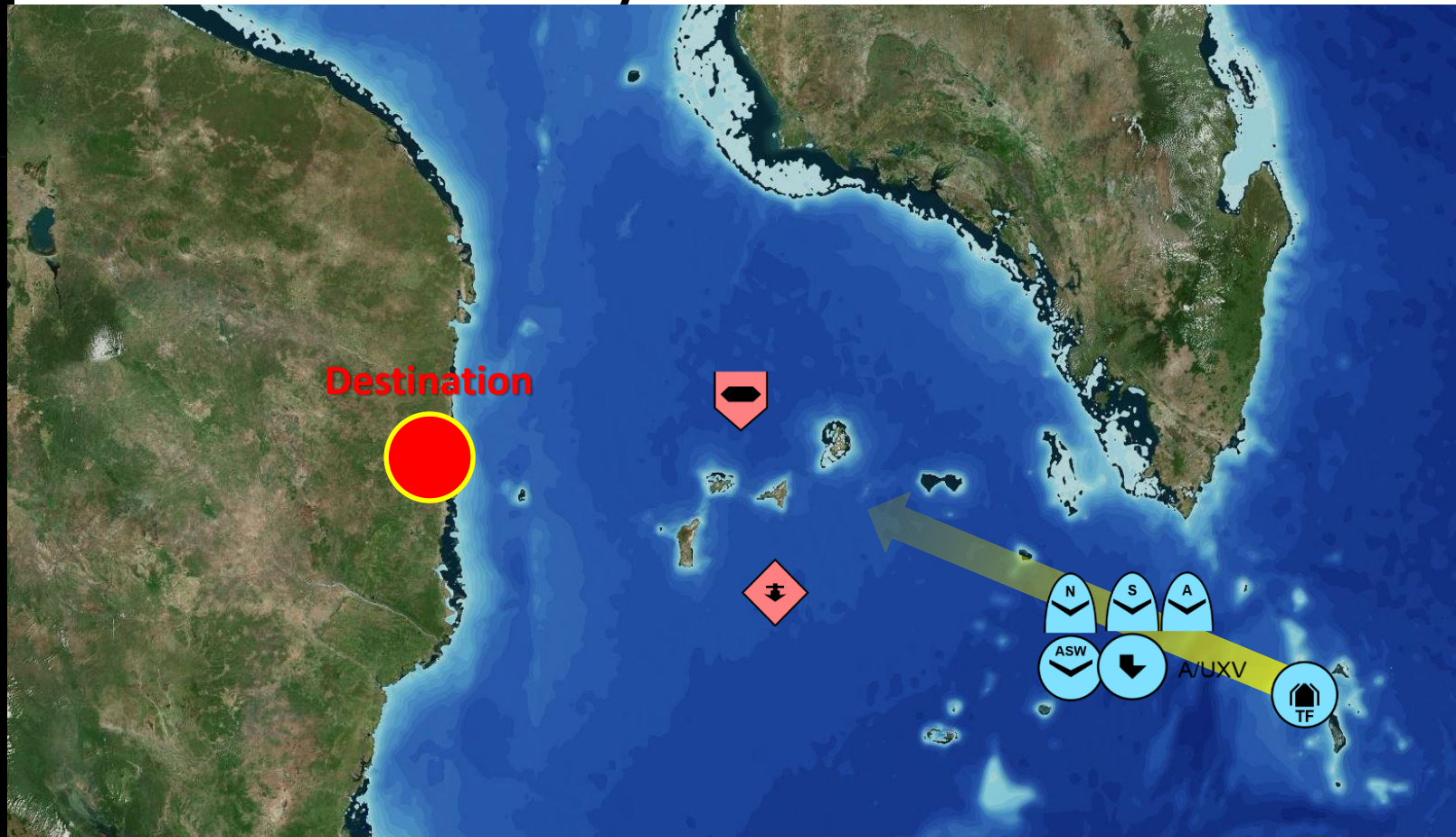
Escort Main Body



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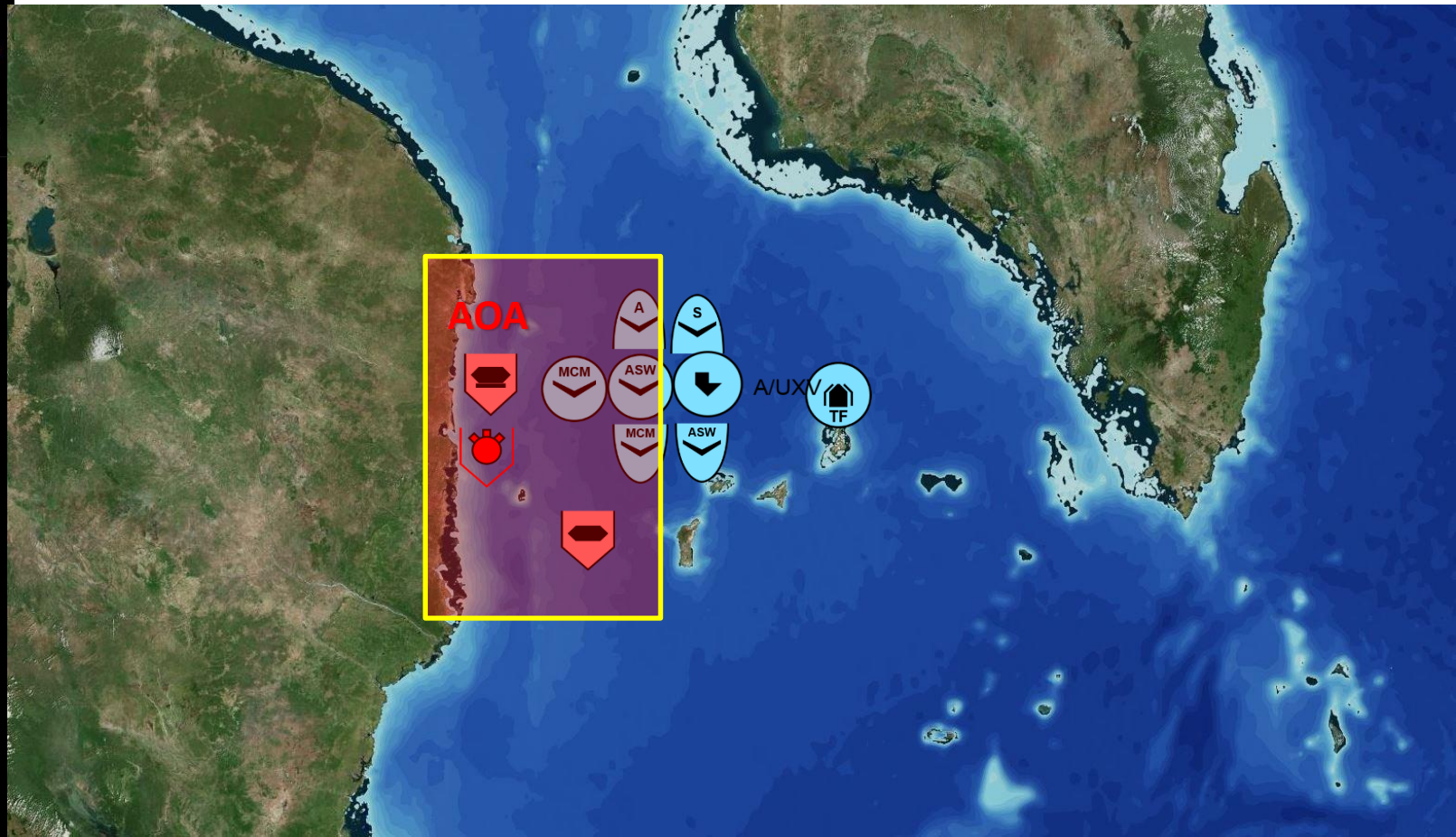
Sanitize OPAREA



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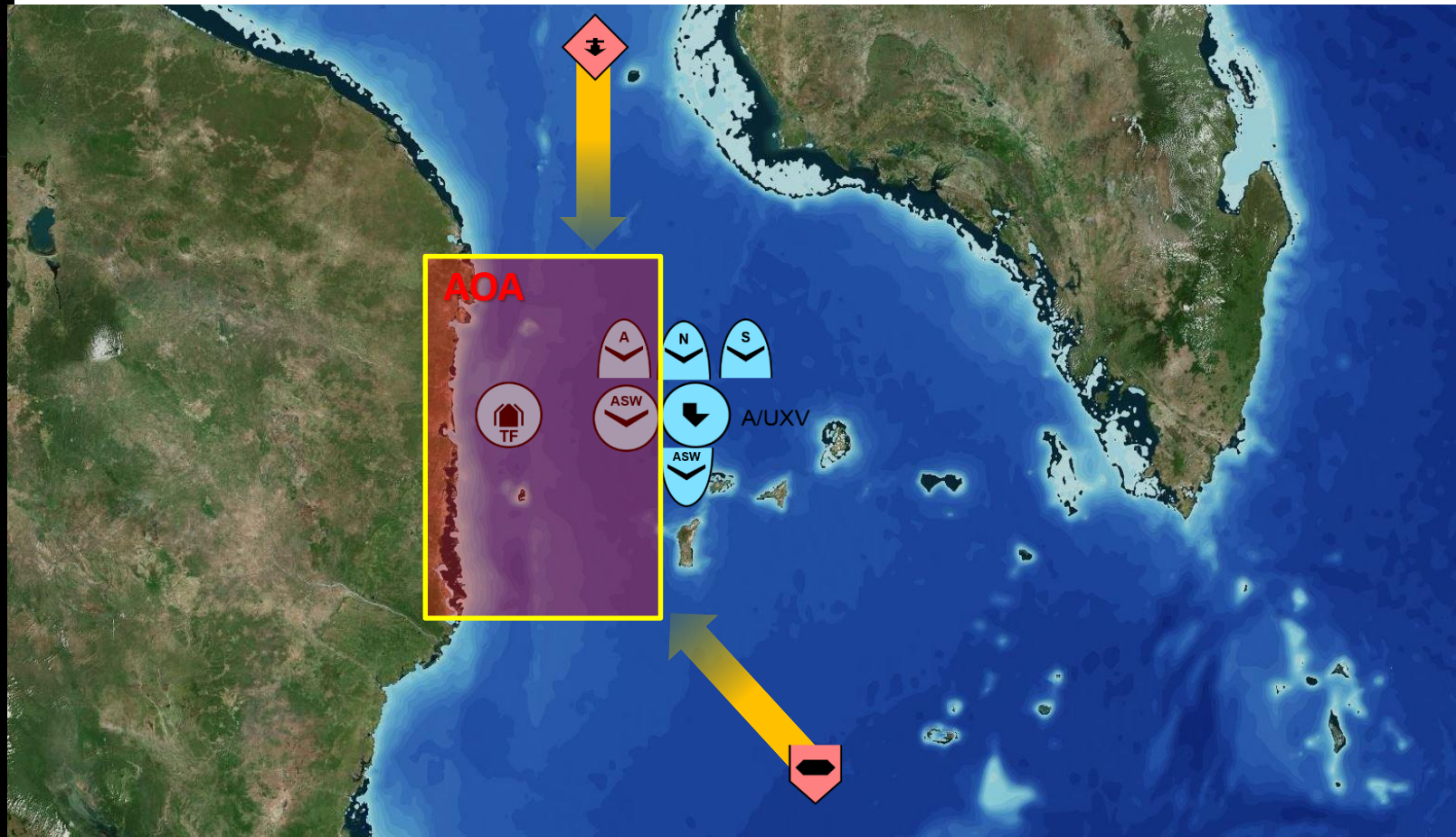
Defend OPAREA



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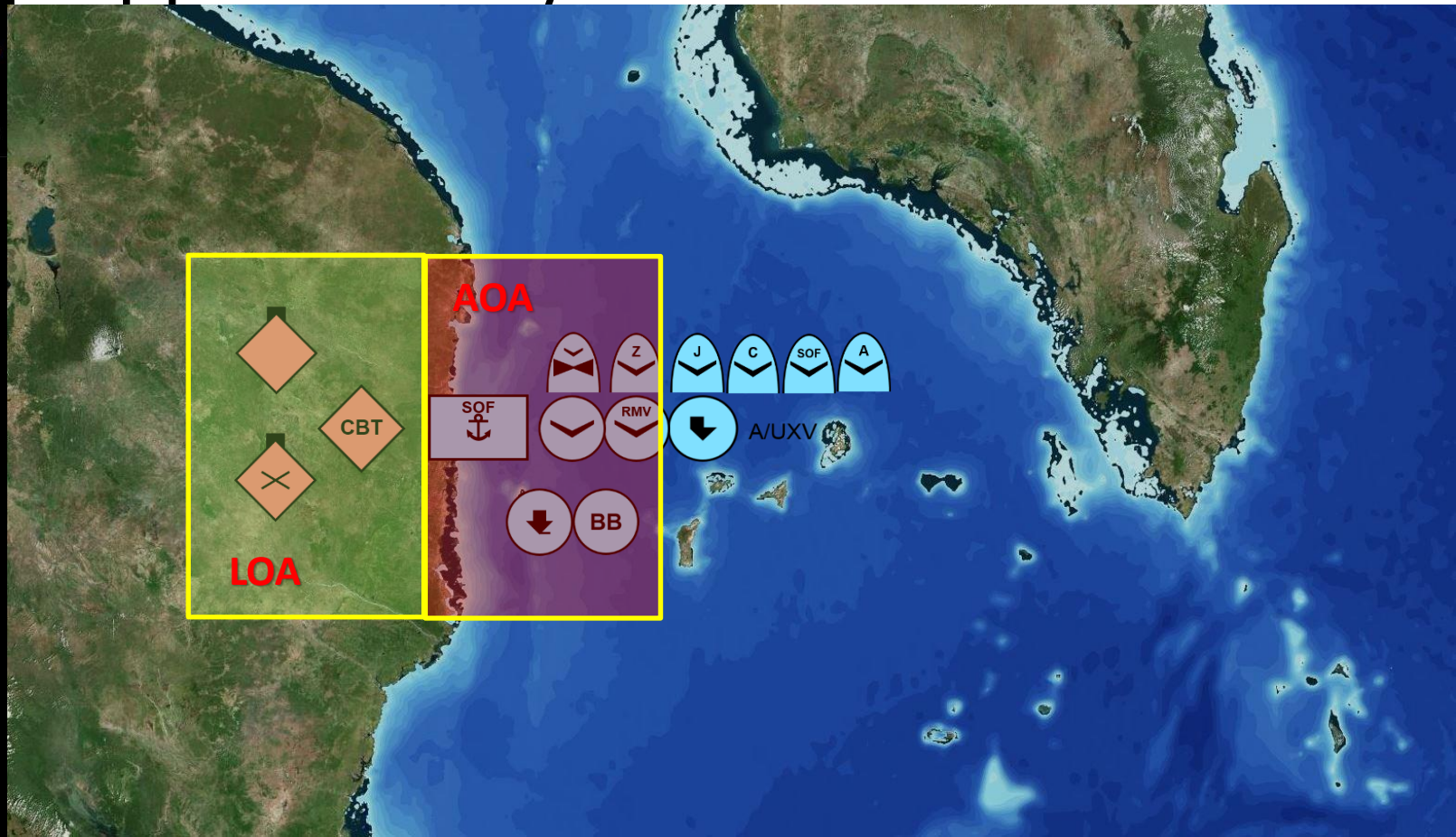
Support CATAF/CLF



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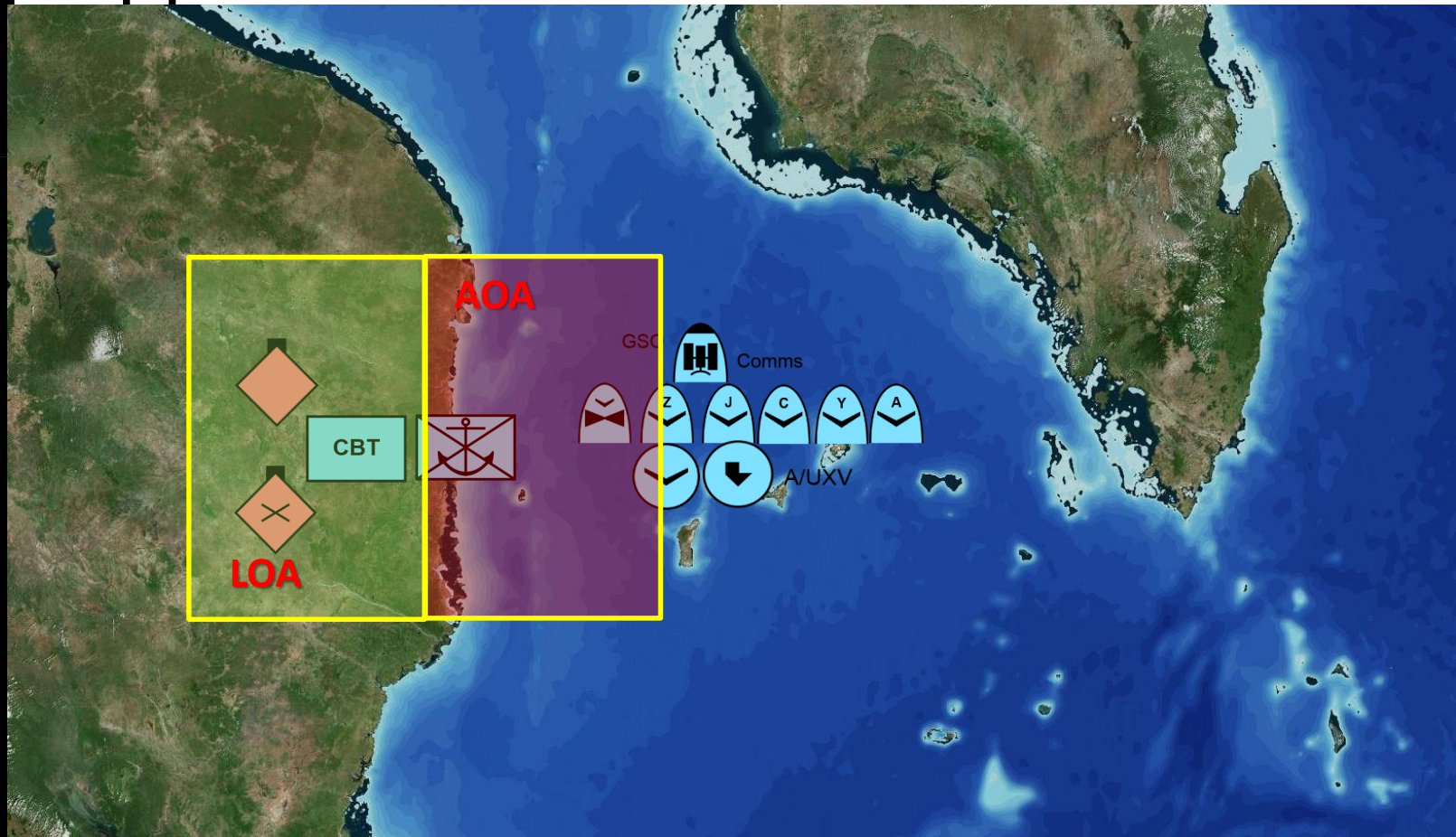
Support Land Forces



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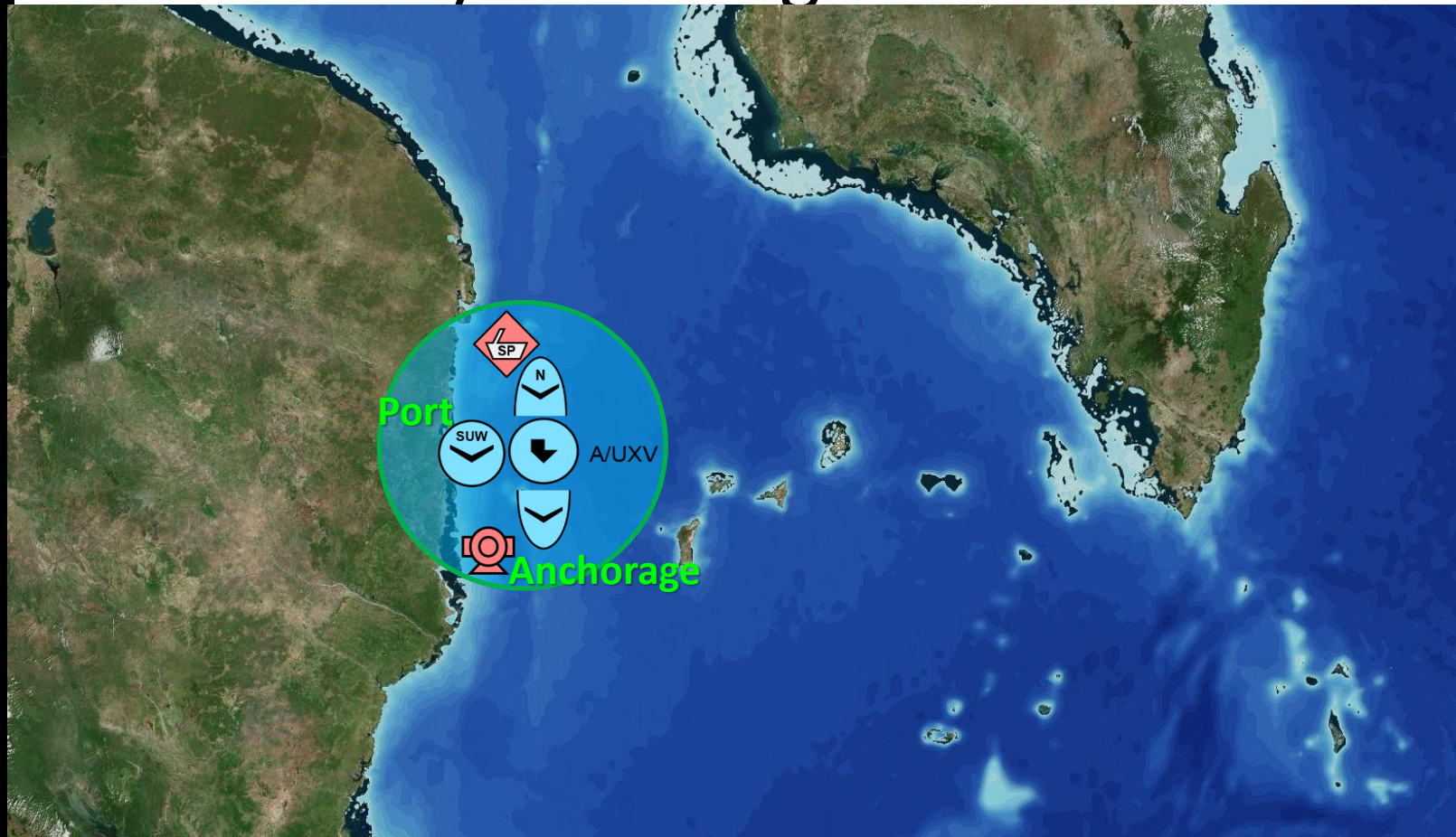
Protect Port/Anchorage



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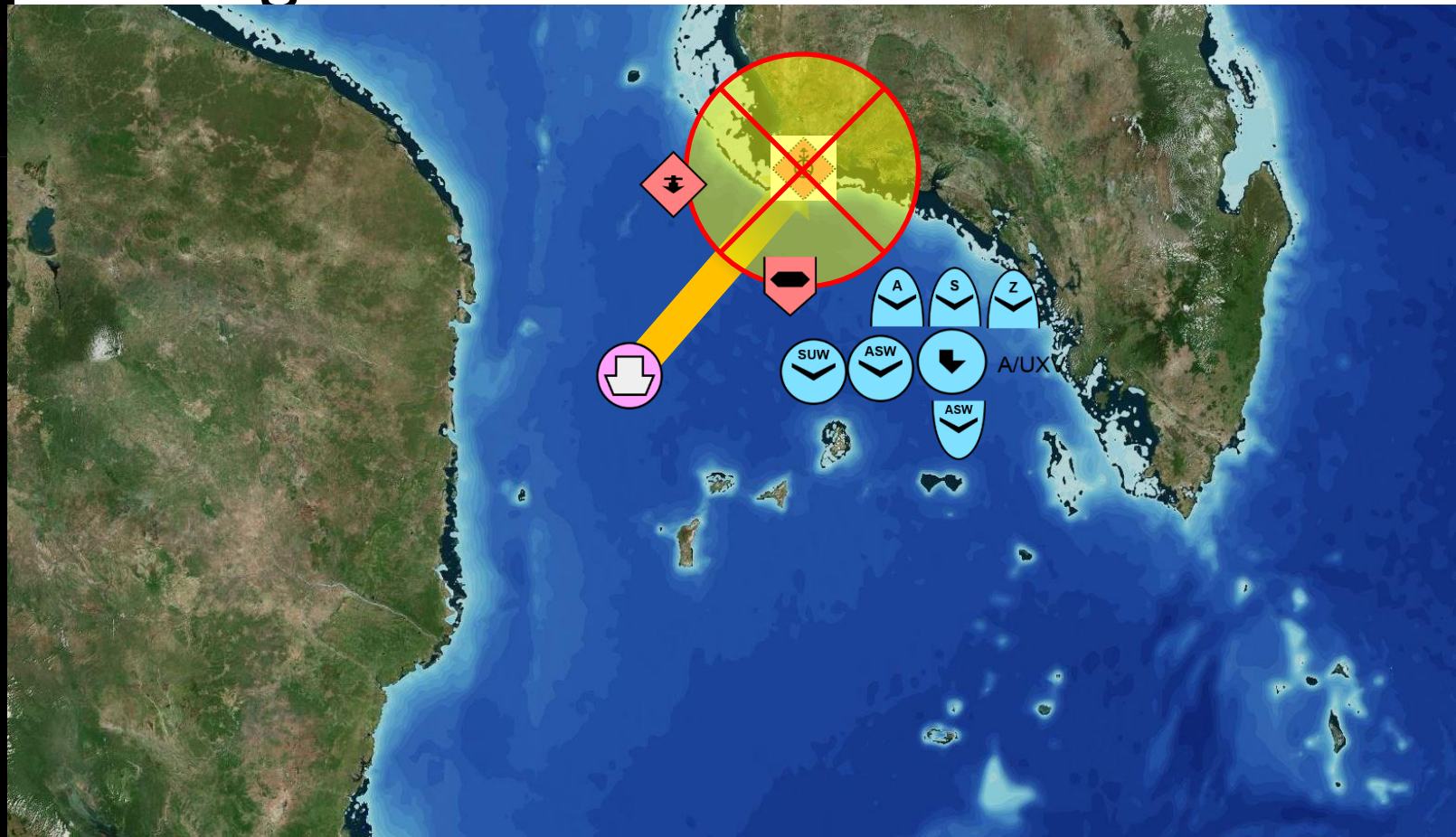
Embargo



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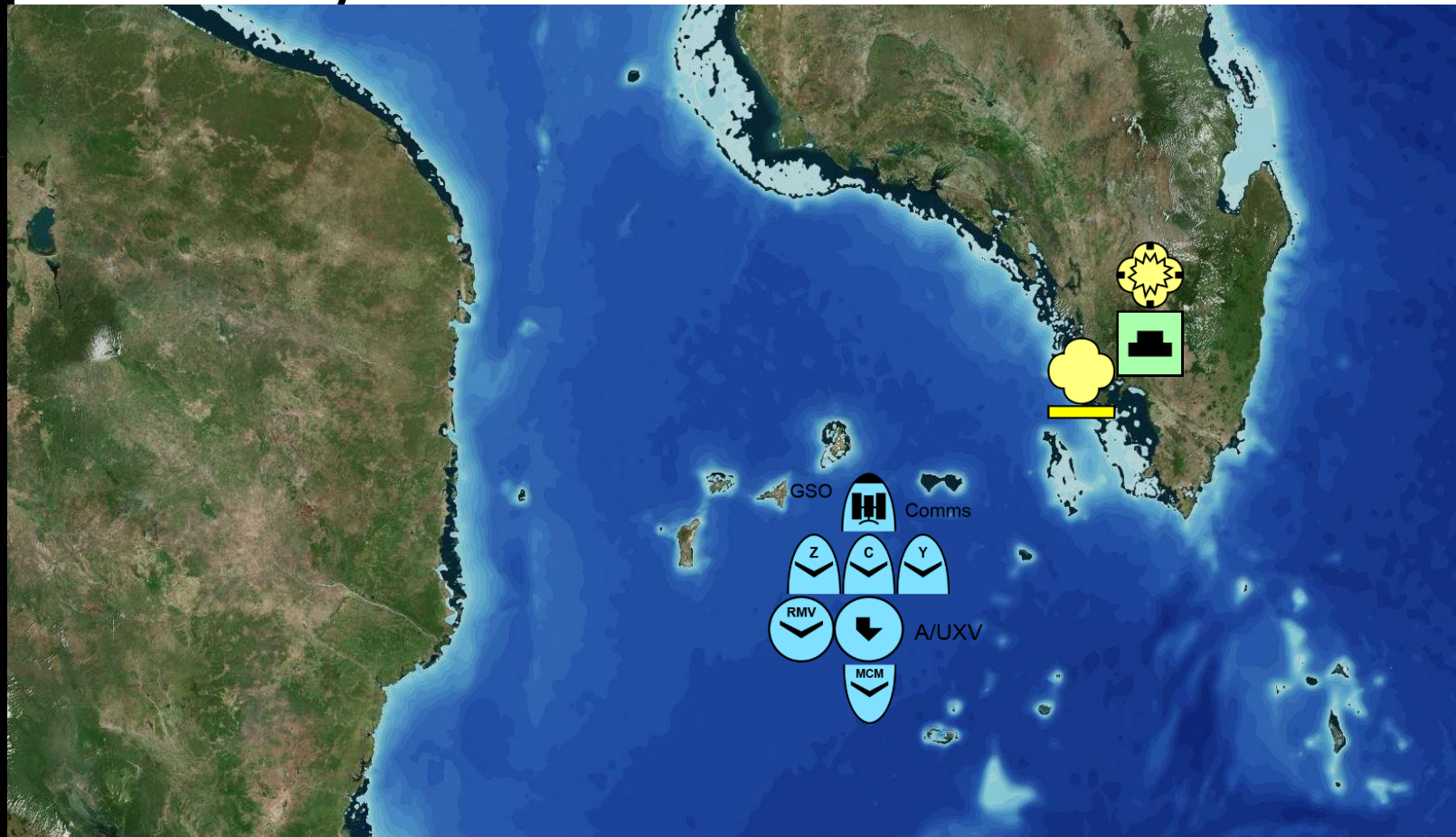
Incident / Disaster Relief



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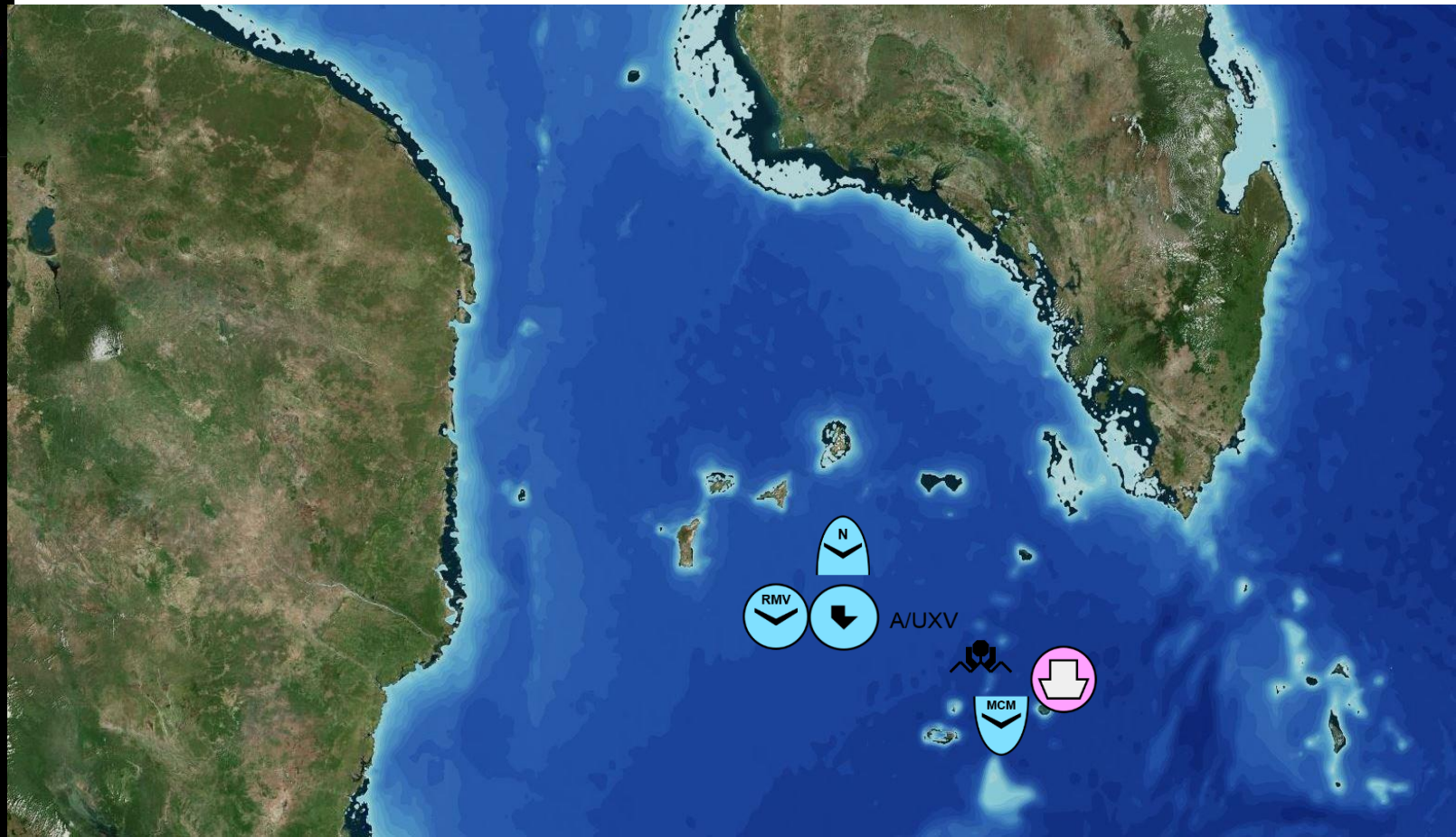
Search & Rescue



Unmanned Vehicles Customization

DOMAINS

	UAV(H)	UUV	USV
ASW	P	P	P
MW	L	P	S
ASUW	P	N	S
SOF	L	S	N
LAND	P	N	N
ASY	P	S	L
AMPH	P	N	L
EW	N	N	S

Legend

P	*Primary*
S	*Secondary*
L	*Limited*
N	*None*

PAYLOADS

	UAV(H)	UUV	USV
Visual	P	L	P
I/R	P	N	P
Radar	L	N	P
MFA Sonar	N	N	L
HFA Sonar	N	L	S
VHFA Sonar	N	P	S
TAS	N	N	P
Comms	P	N	L
Sonobuoys	P	N	S
ASM	S	N	L
Depth Charges	S	N	S
LWT	S	N	P
RESM	N	N	S
Cargo	L	N	S
Personnel	L	N	S

Unmanned Vehicles Customization

PAYLOADS IN DOMAINS								
	ASW	MW	ASUW	SOF	LAND	ASY	AMPH	EW
Visual	S	L	P	L	P	P	P	N
I/R	S	L	P	L	P	P	P	N
Radar	L	N	P	L	L	S	L	N
MFA Sonar	P	L	N	N	N	N	N	N
HFA Sonar	S	P	N	N	N	S	N	N
VHFA Sonar	L	P	N	N	N	P	N	N
TAS	P	N	L	N	N	N	N	N
Comms	P	P	P	P	P	N	P	P
Sonobuoys	P	N	N	N	N	N	N	N
ASM	N	N	S	N	N	L	N	N
Depth Charges	L	N	N	N	N	L	N	N
LWT	P	N	N	N	N	N	N	N
RESM	N	N	S	N	S	N	S	P
Cargo	N	N	N	L	N	N	L	N
Personnel	N	N	N	N	L	N	L	N

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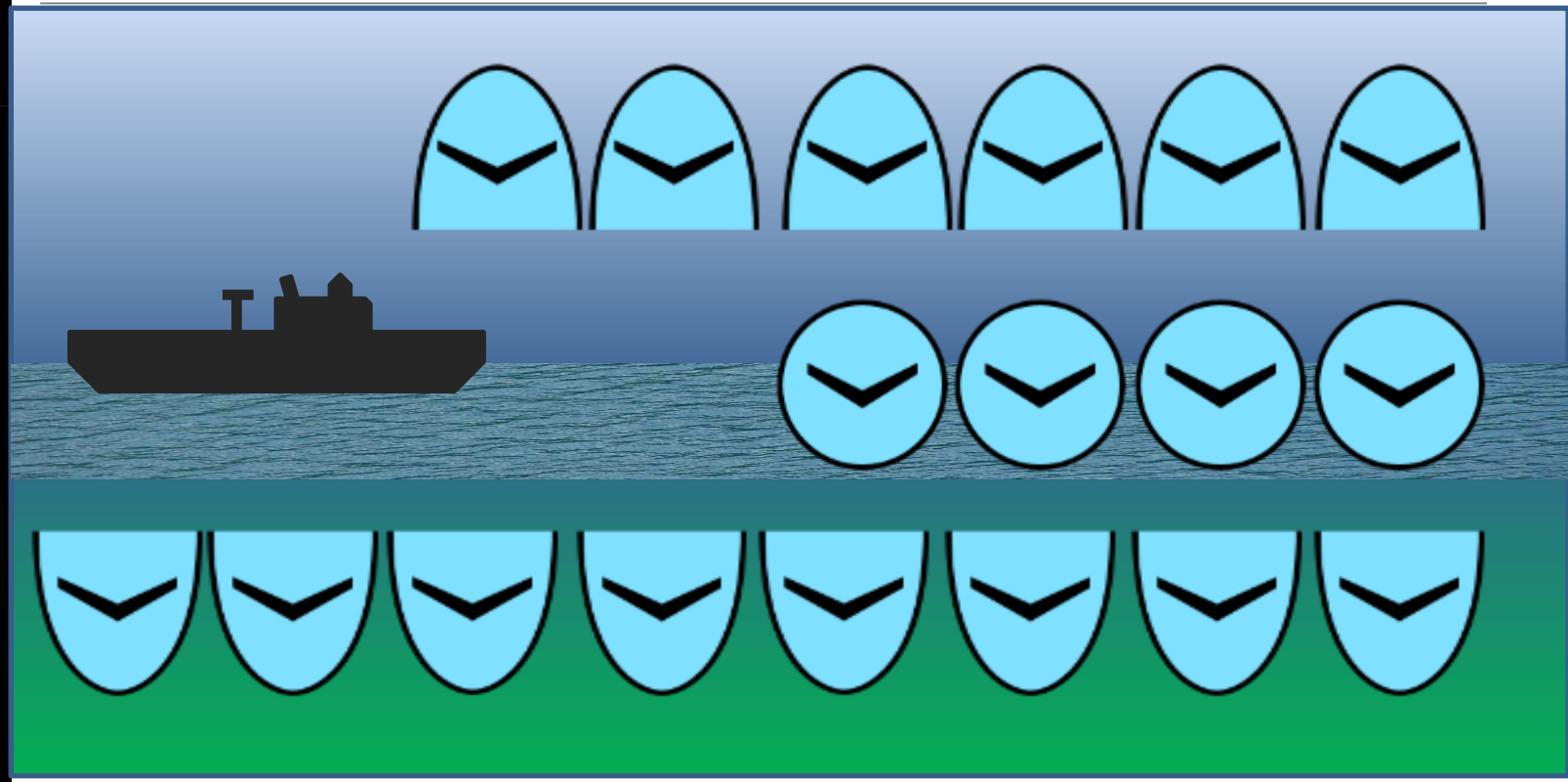
Initial Set of Unmanned Vehicles



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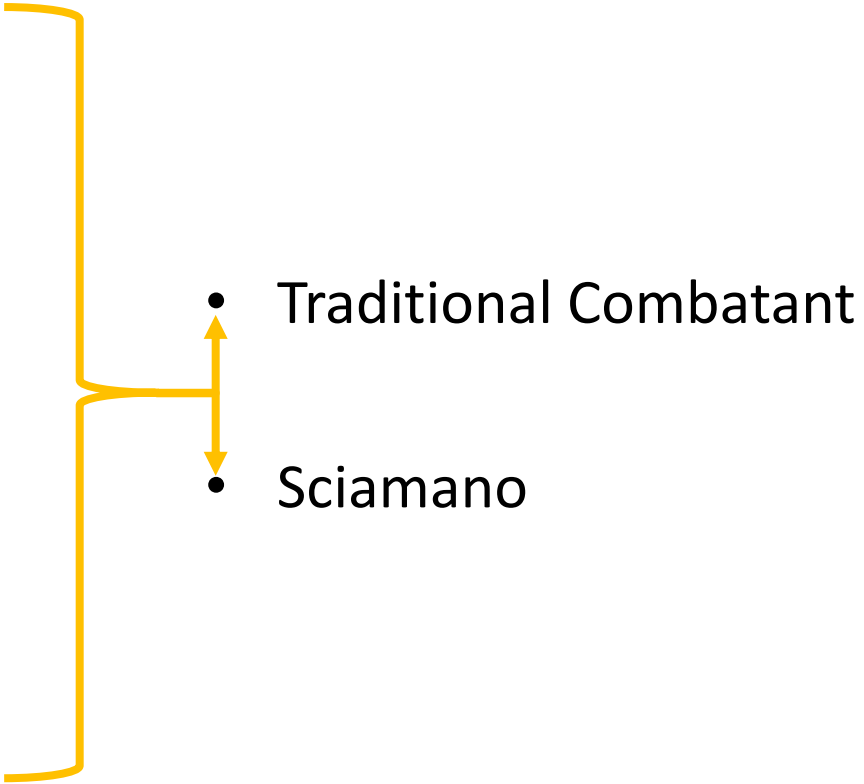
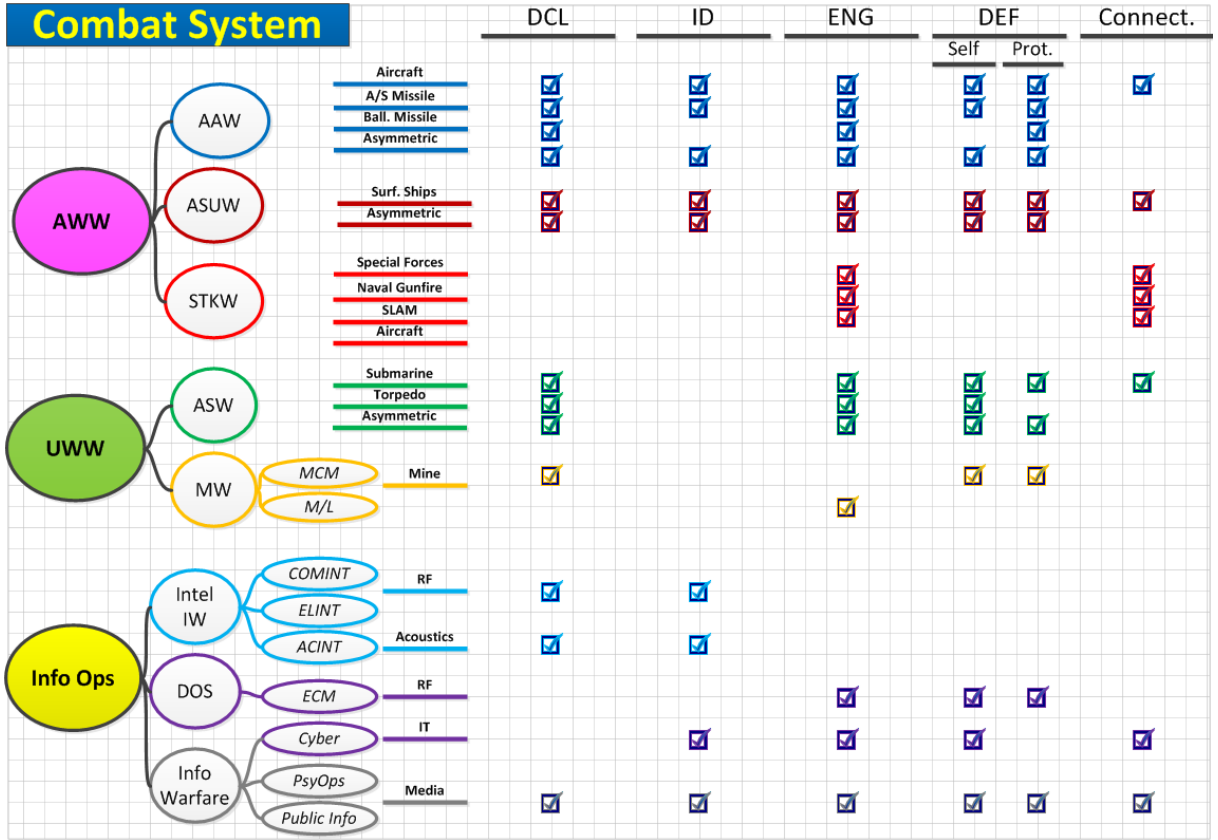
MOP / MOE

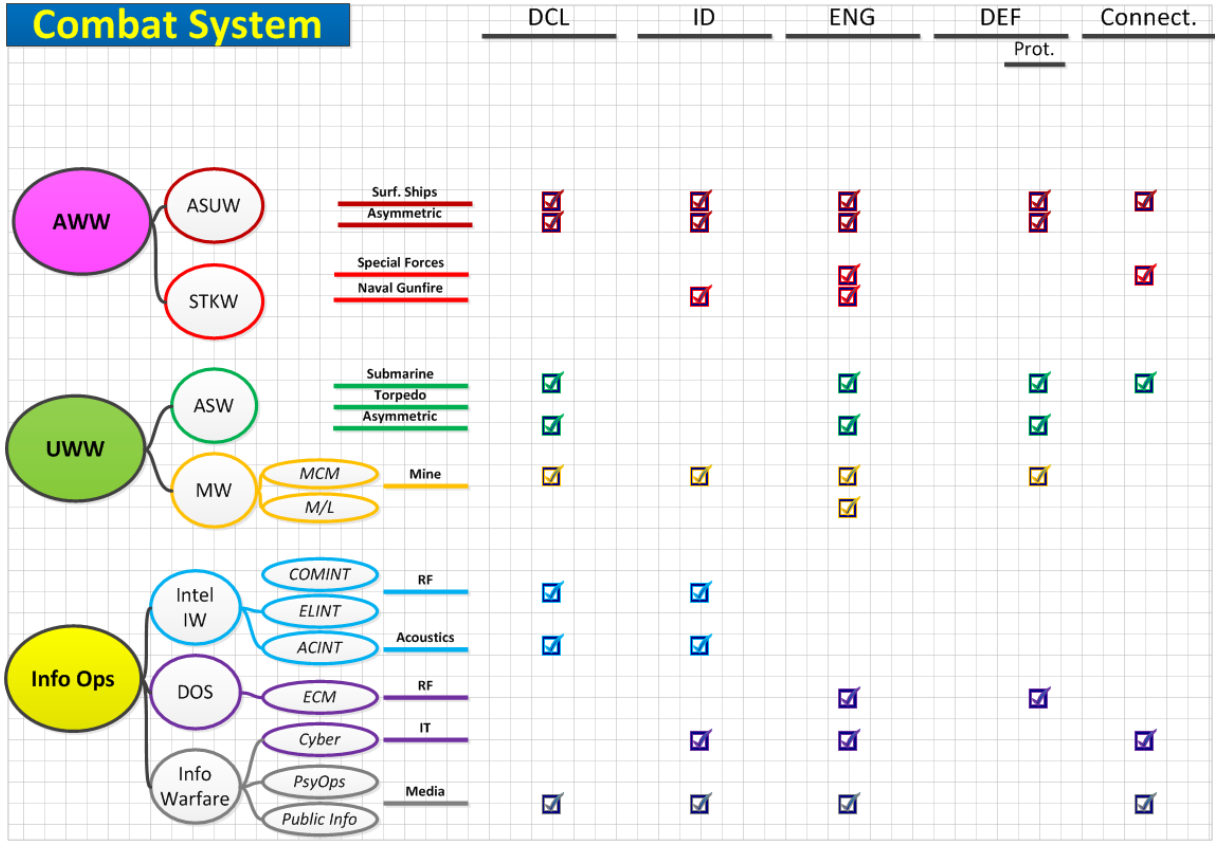
- Combat System
  - By Warfare Area
- Platform
  - Speed
  - Endurance
  - Environment
  - Payload (drones)
- Transversal
  - Signatures
  - Interferences



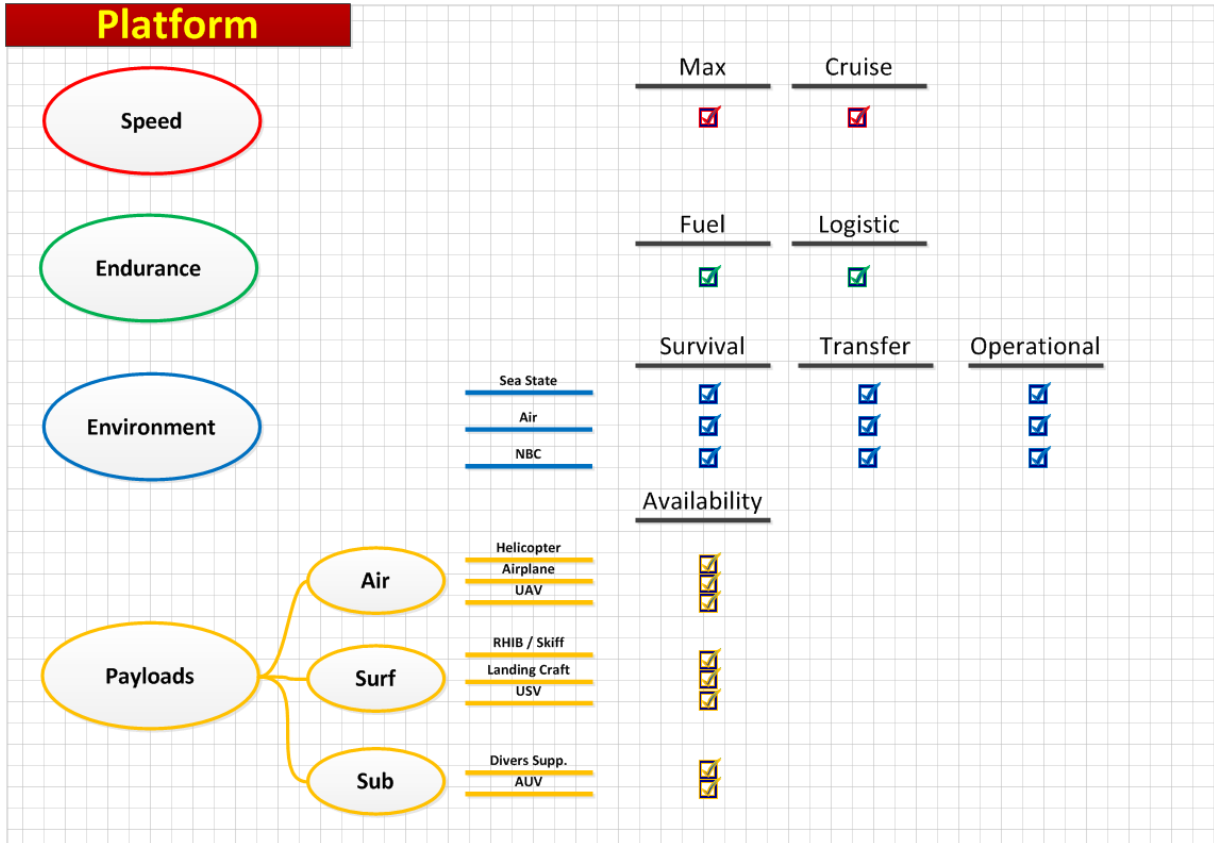
MOP – Traditional Combatant



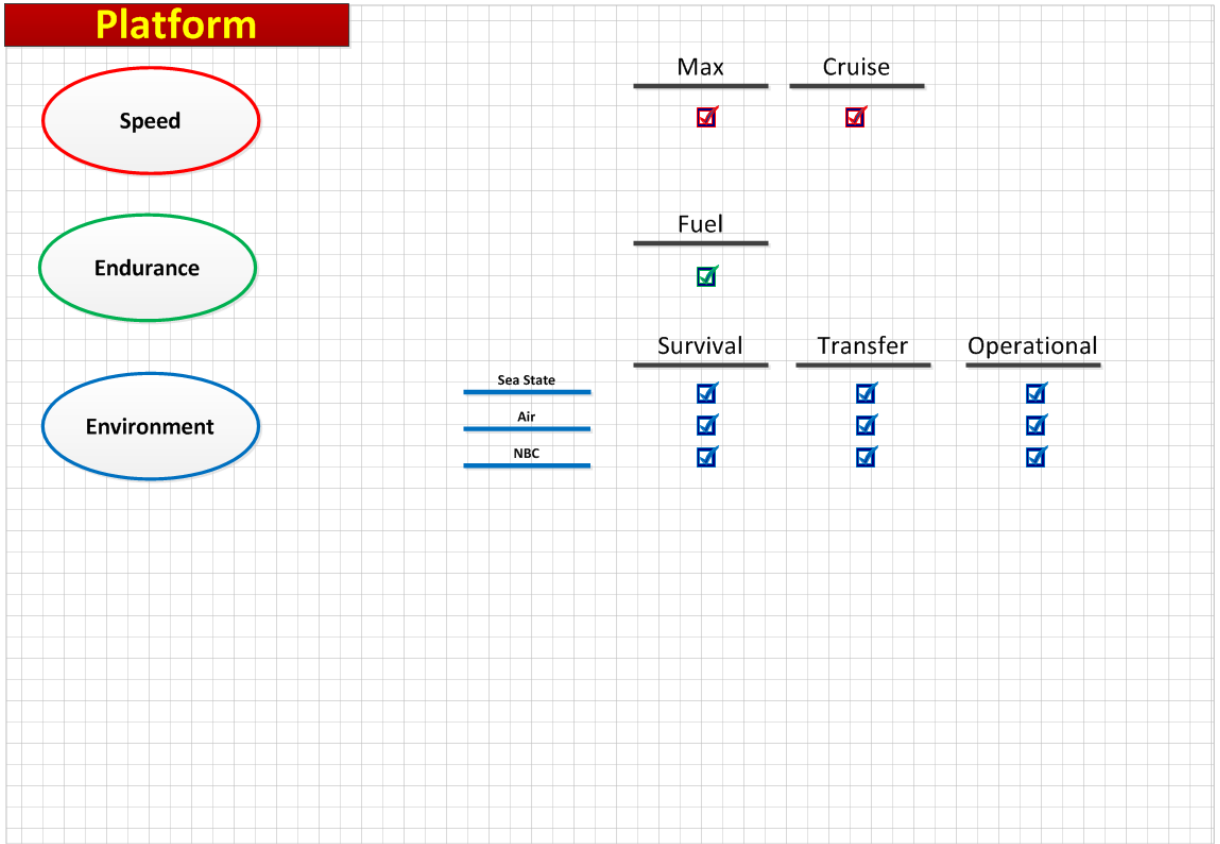
MOP – Sciamano



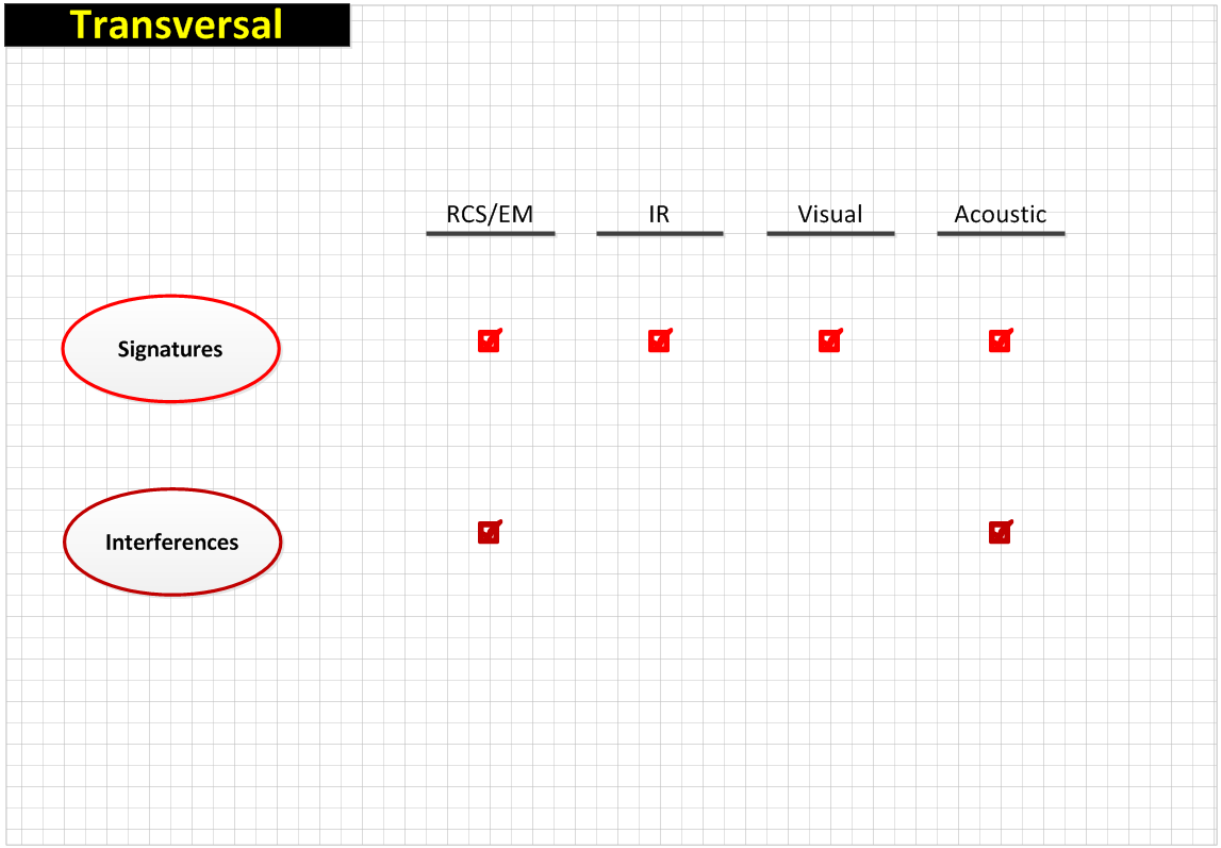
MOP – Traditional Combatant



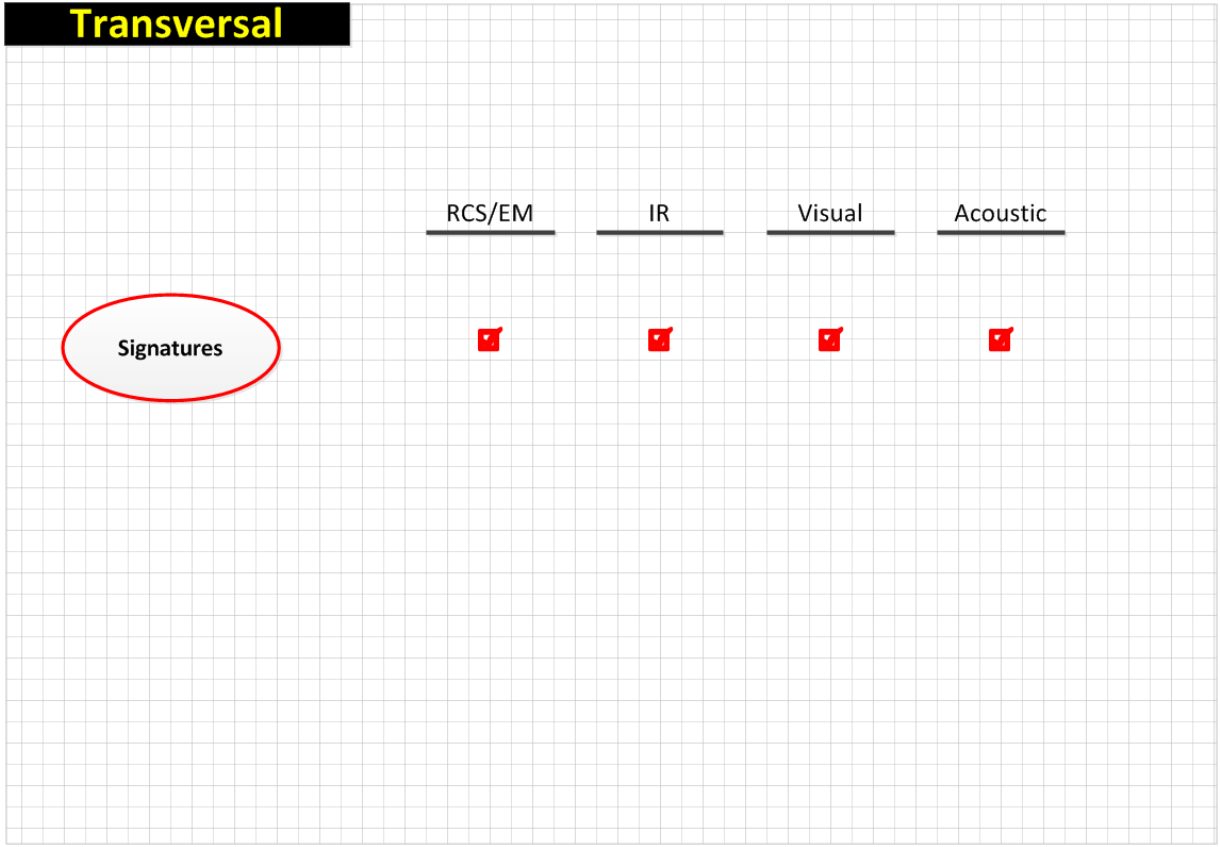
MOP – Sciamano



MOP – Traditional Combatant



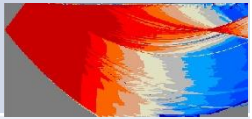
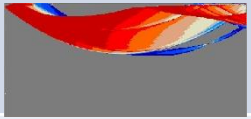
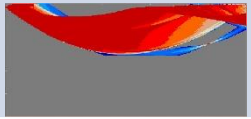
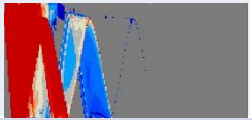
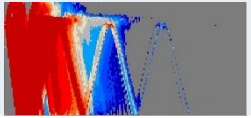
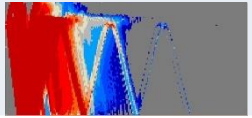
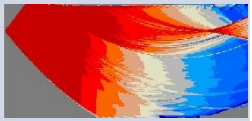
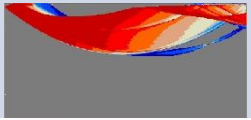
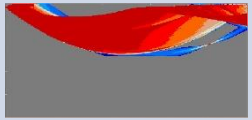
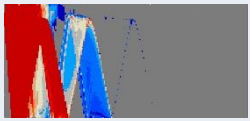
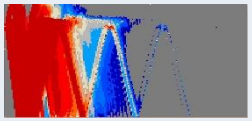
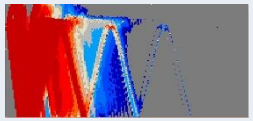
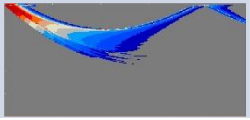
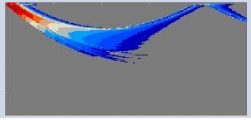
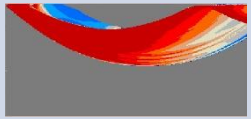
MOP – Sciamano



Status - Conditions

Mission	UAV (S/B)	USV (DS)	USV (VDS/TAS)	AUV (HFAS)
Sciamano				
Sanitation (t = 6 hrs)	4	2	1	6
Escort (t = 24 hrs)	Not considered	1.5	1.5	Not Considered
ASW Frigate				
Equipment (t = 6/24 hrs)	HMS (MF)	VDS/TAS (LFAS)	Helicopter (DS)	Helicopter (SB)

Status - Conditions

Mission	Propagation	Sc. Dipping	Sc. VDS/TAS	ASW Frigate
Sanitation	Sound Channel			
	Bottom Bounce			
	Convergence Zone	Not Available		
Escort	Sound Channel			
	Bottom Bounce			
	Convergence Zone			

Status - Results

Mission	Propagation	Sciamano	ASW Frigate
Sanitation	Sound Channel	Best	Good
	Bottom Bounce	Best	Good
	Convergence Zone	None	
Escort	Sound Channel	Good	Good
	Bottom Bounce	Fair	Good
	Convergence Zone	Negligible	Best

Way Ahead

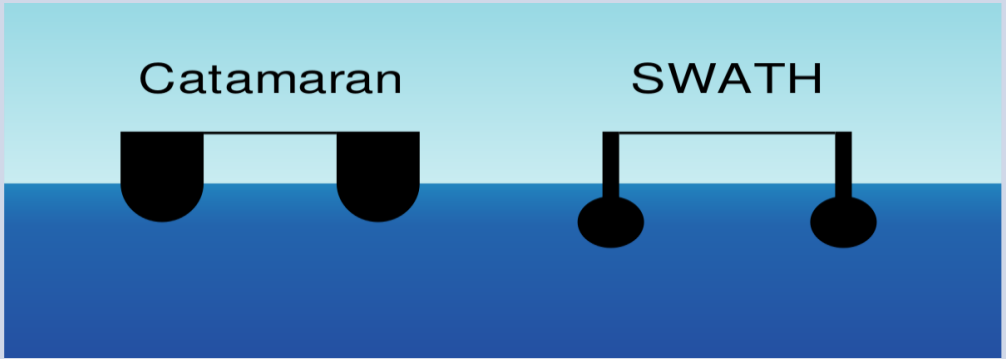
- Self-Defense
  - Obvious?
  - Measurable?
- Engagement
  - Torpedo
  - ASW Spoof?
  - Depth Charges?

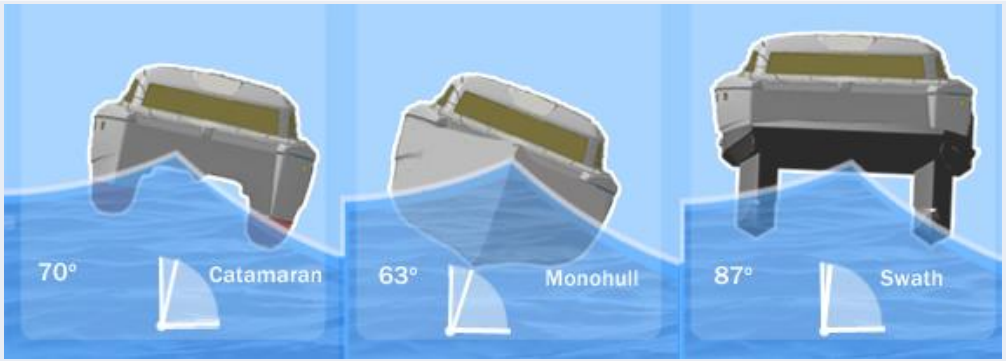
Way Ahead

Hull Configuraton	
Traditional	Catamaran
SWATH	Hybrid

Way Ahead

Platform Behavior

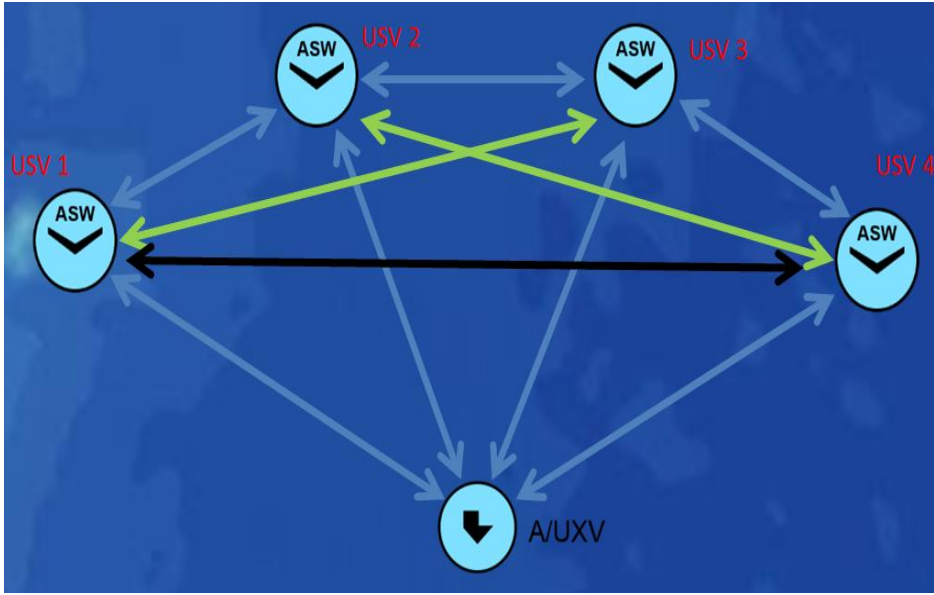




Way Ahead

Network Configuration

- Control the vehicles
- Receive vehicles navigational data
- Receive/download information collected by vehicles' sensors
- Emergency shot-down
- Relay of information/ orders.



Sciamano Concept Study

Q&A

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