

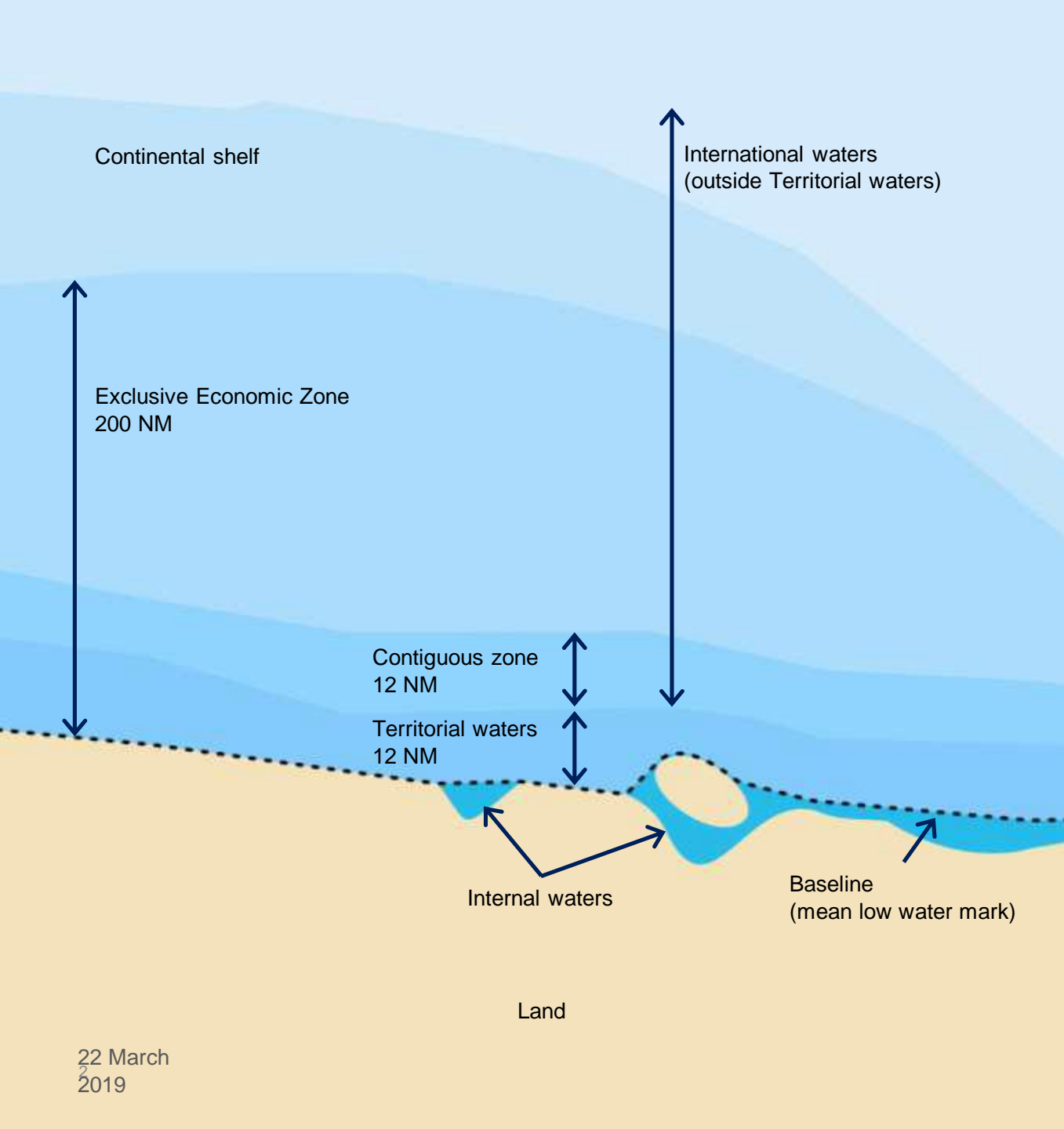


Integrated Coastal Surveillance Systems

DEFENCE AND SPACE

Olivier Yvon // World Border Security Congress, Casablanca
20. March 2019

AIRBUS



United Convention on the Law of the Sea

UNCLOS

- Maritime Safety and Security is driven by international laws and conventions.
- Main one is the UNCLOS signed in 1982, in force since 1994 and today signed by 168 countries.
- UNCLOS has created borders for each sovereign nation with full responsibility on territorial waters, responsibilities regarding customs, immigration and pollution on contiguous waters and rights to exploit natural resources on the Economic Exclusive Zone
- Safety Of Life At Sea convention from IMO is another driver, in particular the Automatic Identification System to avoid collision and enable cooperative tracking and identification

Threats at sea and Border Guard missions

Threats of both safety and security nature

Threat patterns differ according to the geographical location

Terrorism, piracy, smuggling



Illegal immigration

Illegal fishing

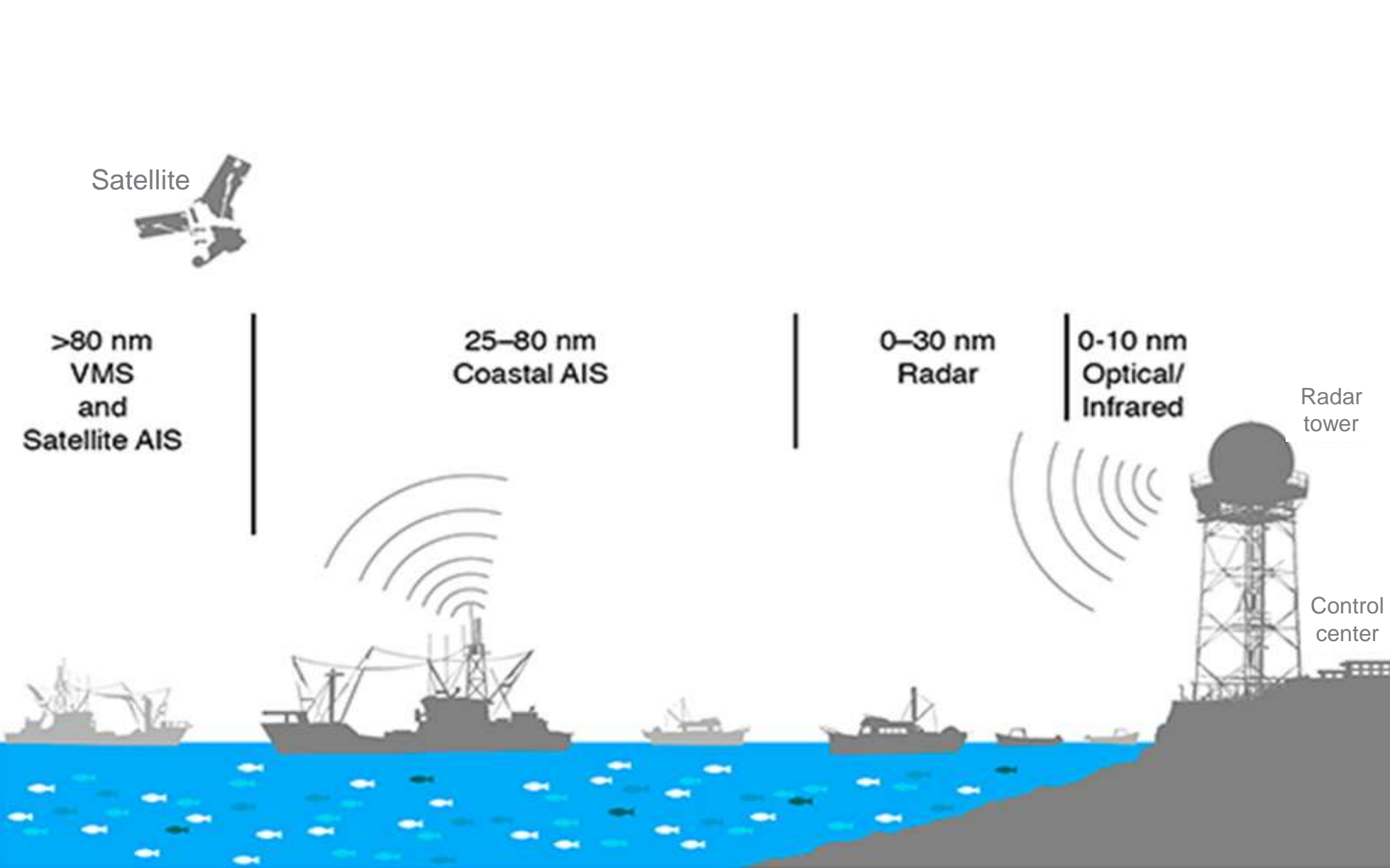


Sea pollution

Navigation monitoring and traffic safety



Support Search And Rescue



Integrated Coastal Surveillance System

Maritime awareness of territorial and contiguous waters, possible extension to maritime domain

Real-time, full coverage of territorial and contiguous waters

Detection of small non-cooperative boats

Network-centric



Sensors tower with long-range capabilities

Coastal Surveillance Radar is the primary sensor, other sensors include AIS and Electro-Optical/Infrared camera.

To achieve long range surveillance for all sensors, high towers are necessary.

Radar is able to detect large and small, slow and fast-moving boats at long range (within territorial waters for small boats, on territorial and contiguous waters for medium-sized vessels).



Coastal surveillance

- Real-time
- Time-critical
- Territorial waters

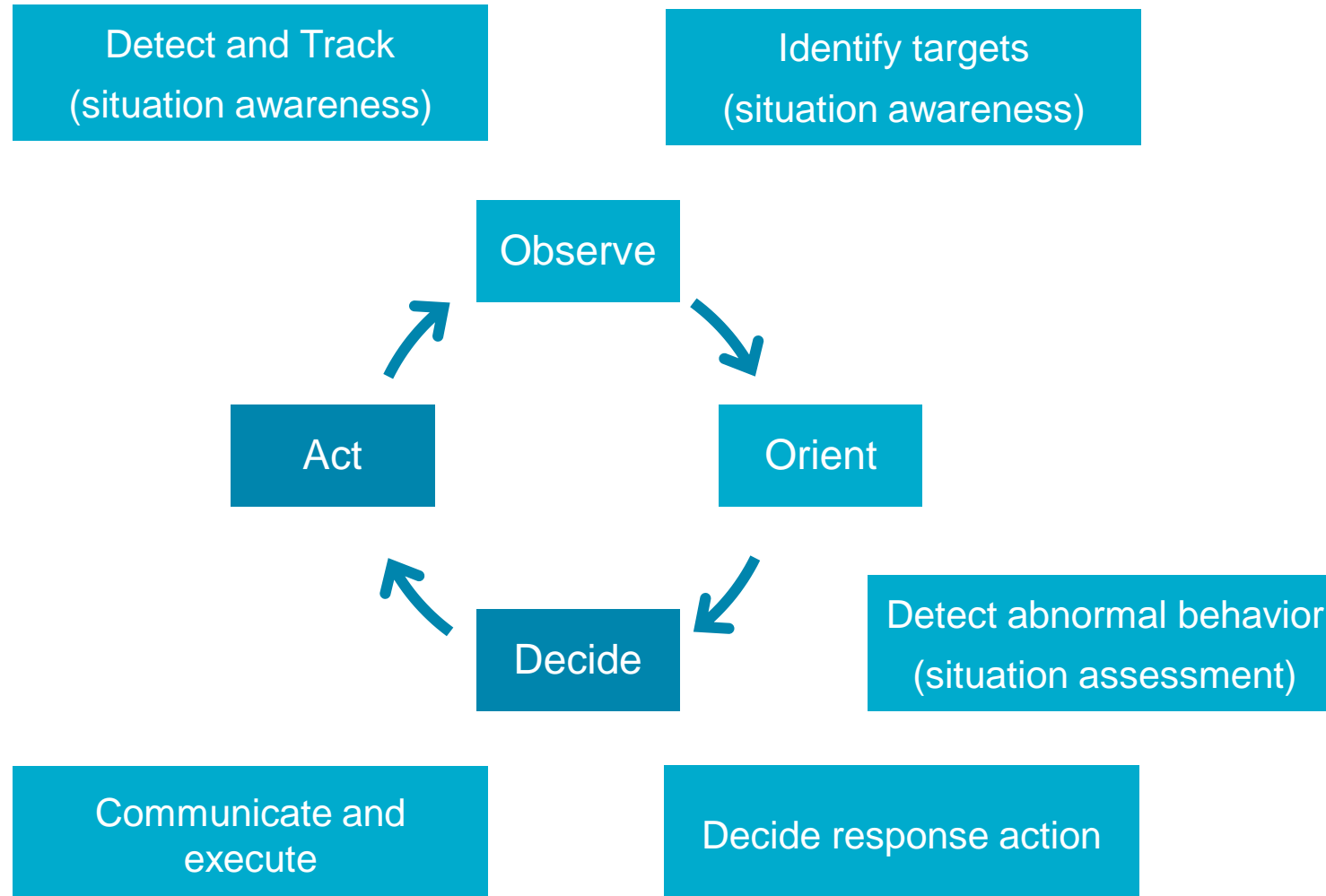


A network of fixed towers, gap fillers to cover territorial and contiguous waters

Reliable data network required to connect towers to command and control (C2) centres

Operations can be either located at towers or remote from C2 centres

The OODA loop applied to Law Enforcement



MARITIME RADAR	Detect Track
AIS	Detect Track Identify
CAMERA EO/IR	Identify Watch
MARITIME VHF	Identify Order
VESSEL DATABASE	Identify
ZONES & RULES	Alarm



C2 Centres

High-tech processing

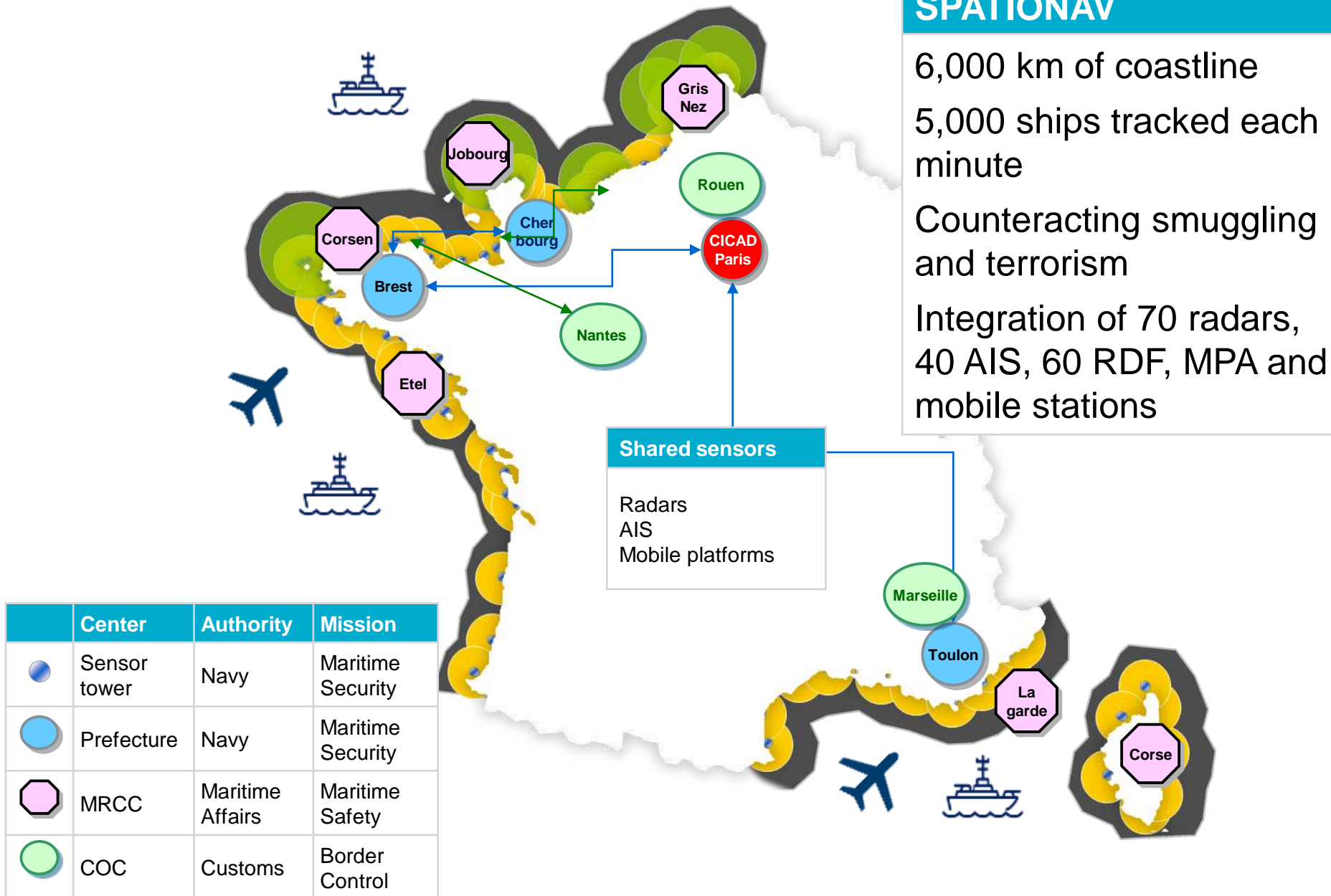
- Automatic multi-sensors data fusion
- Artificial Intelligence
- 3D view
- Ergonomic HMI and operator position

Coastal Surveillance Systems

SPATIONAV: a system designed to provide real-time decision making tools to assist French authorities gather information and direct maritime surveillance and intervention at sea.

SPATIONAV

6,000 km of coastline
 5,000 ships tracked each minute
 Counteracting smuggling and terrorism
 Integration of 70 radars, 40 AIS, 60 RDF, MPA and mobile stations



Coastal Surveillance Systems

Tools of multinational cooperation

- Threats do not stop at borders
- Exchange of contacts of interest between partner countries
- Key feature is interoperability of the systems

INFORMATION INTELLIGENCE

AIR

Satellite



MPA Aircraft



SAR Helicopter



UAV / Aerostat



SEA

Navy



Coast Guard



Police



Regional / National Control Centers



12NM | 25NM

200NM

From Coastal...

... to Maritime Situation Awareness

What is it?

Runs on sunshine in the **stratosphere**



Weighs **75 kg**



Supports up to **5 times** its own weight



Powered by **the sun**

Zephyr uses **solar energy, with secondary batteries** charged in daylight to power overnight flight



25 m wingspan

Manufactured from fibres no thicker than **a human hair**



A few facts...

Operating at altitudes > 70,000 ft (lower Stratosphere)

Flies above the weather and conventional air traffic

Can be airborne for over 3 months

Exclusively solar powered

World's only flight proven HAPS with more than 1.500 flight hours yet

Routine flight clearance by military and civil authorities

What will it do?

Zephyr:



See clearly



Sense efficiently



Connect precisely

Zephyr is able to **revolutionise missions** all over the world:



Defence



Humanitarian



Security



Environmental

New technologies: High-altitude Pseudo-satellites

First solar-electric stratospheric unmanned aerial vehicle

Zephyr flies for longer than any other aircraft during its successful maiden flight:


25 days, **23** hours, **57** minutes



Morocco, Pioneer and leader in Maritime Safety and Security

with Airbus support

- Gibraltar Strait Traffic Control System
- Tangiers Med Port Security System
- Casablanca and Laayoune VTS



Thank you for your attention

شكرا على الاهتمام

Je vous remercie de votre
attention

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