

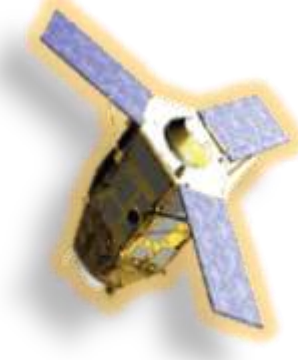
# Pleiades Neo -30cm Maritime Insights from MDA



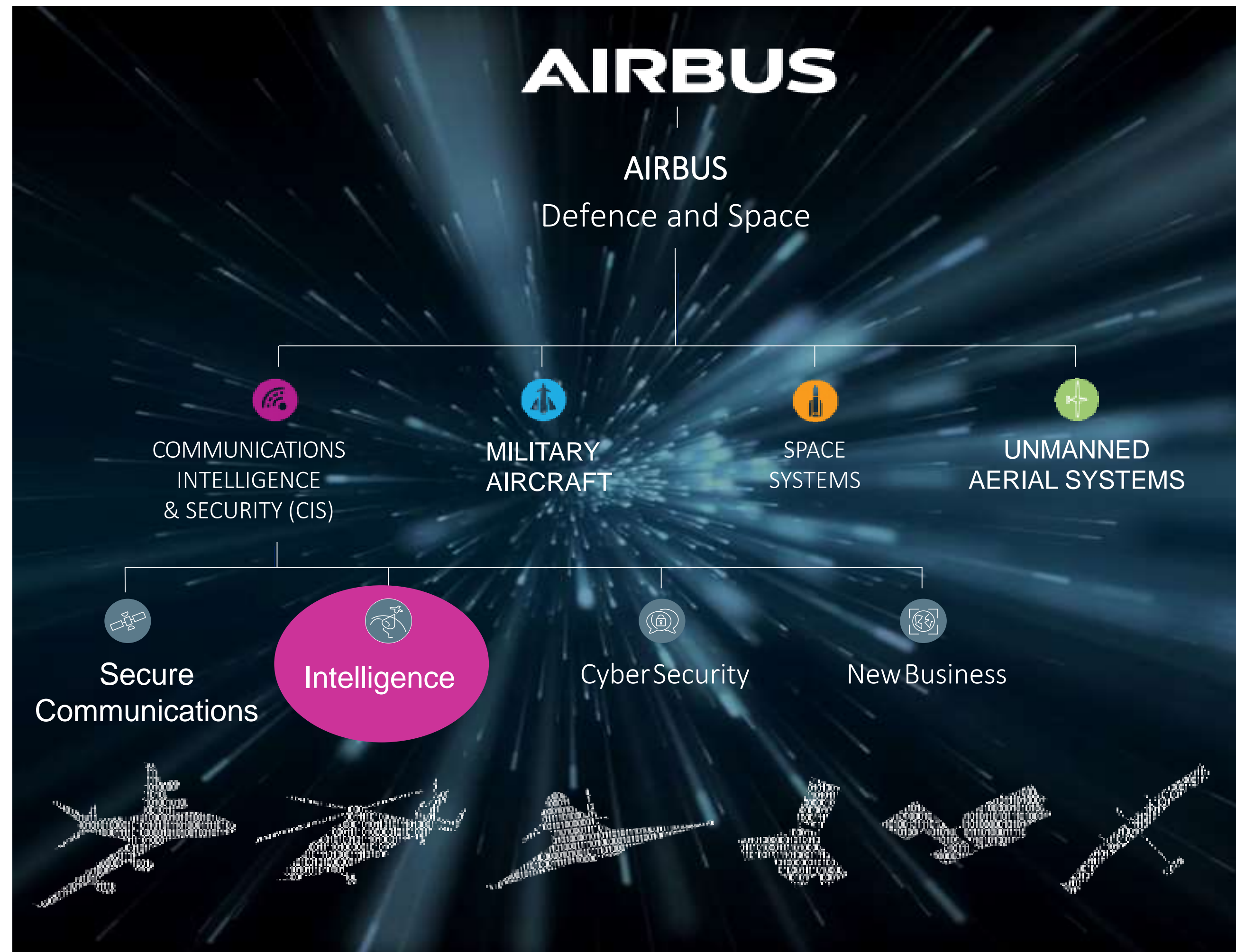
**Airbus Constellation**

**AIRBUS**

Presented by : Dheeraj Mehra  
CEO - MICRONET



As part of the Airbus group, we benefit from the **power and strength** of a **global leader** in aerospace, defence and related services, **guaranteeing confidence** in our commitment to provide sustainable Earth observation and defence solutions.



### Pléiades Neo

**30 cm**  
Revisit capacity  
twice daily, anywhere

Daily acquisition capacity:  
2,000,000 km<sup>2</sup>

### Pléiades 1a/1b

**50 cm**  
Revisit capacity  
daily, anywhere

Daily acquisition capacity:  
700,000 km<sup>2</sup>

### Vision-1

**90 cm**  
Daily to 8 days, anywhere,  
depending on latitude and  
partner satellites

Daily acquisition capacity:  
20,000 km<sup>2</sup>

### SPOT 6/7

**1.5 m**  
Revisit capacity  
daily, anywhere

Daily acquisition capacity:  
6,000,000 km<sup>2</sup>

### RADAR Constellation

**From 25cm to 40 m**  
Revisit capacity  
daily for most latitudes

Daily acquisition capacity:  
5,400,000 km<sup>2</sup>

### DMC Constellation

**From 12 to 24 m**  
Revisit 3-5 days anywhere

Daily acquisition capacity:  
10,000,000 km<sup>2</sup>



DEFENCE AND SPACE

# AIRBUS CONSTELLATION OF SATELLITES

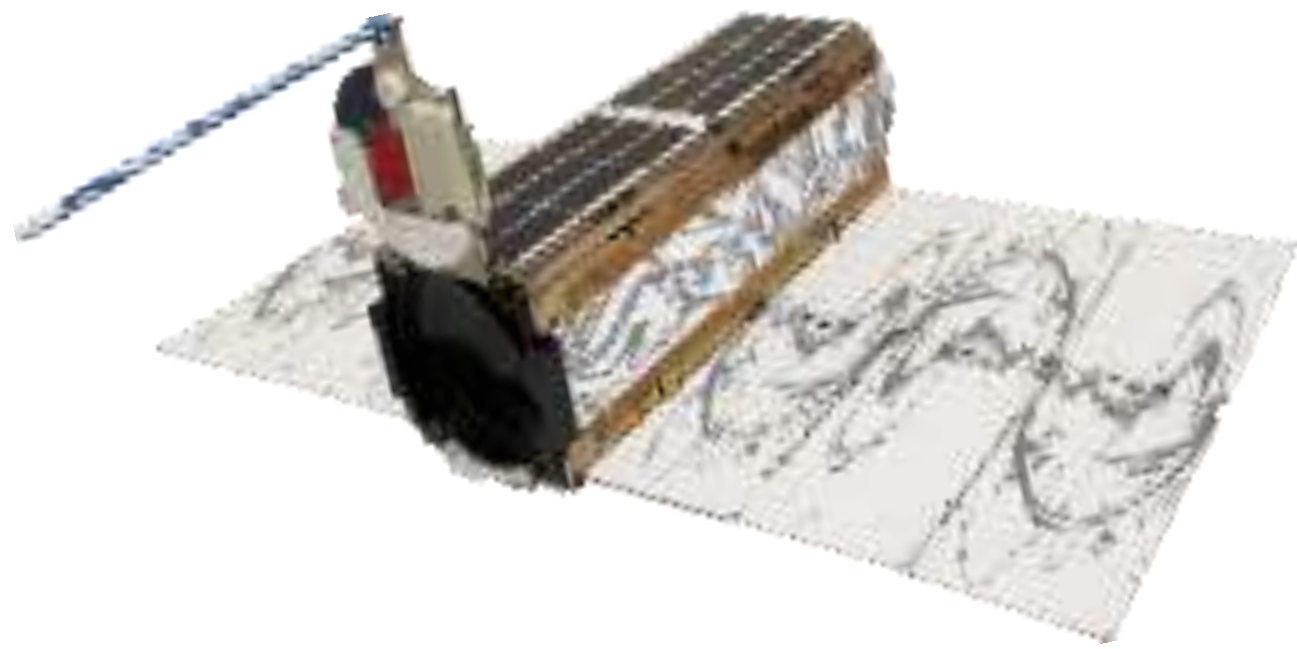




	Swath	Revisit capacity	Resolution	Daily acquisition capacity:
<b>PLEIADES NEO</b> (launch in 2021) <b>30cm</b>	14 km	twice daily, anywhere	Pan: 30cm Multispectral: 1.2m	2,000,000km <sup>2</sup>
<b>Pléiades</b> <b>50cm</b>	20 km	Revisit capacity twice daily, anywhere	Pan: 50cm Multispectral: 2m	700,000km <sup>2</sup>
<b>Vision-1</b> <b>90cm</b>	20.8 km	Revisit capacity daily to 8 days	Pan: 0.9m Multispectral: 3.5m	20,000m <sup>2</sup>
<b>SPOT 6/7</b> <b>1.5m</b>	60 km	Revisit capacity twice daily, anywhere	Pan: 1.5m Multispectral: 6m	6,000,000km <sup>2</sup>
<b>Radar Constellation</b> <b>0.25m-40m</b>	Swath from 4-270 km	Revisit capacity daily for most latitudes	25cm to 40m	5,400,000km <sup>2</sup>
<b>DMC Constellation</b>	640 km	Revisit capacity daily to every 2 days, everywhere on Earth	Resolution 22m	22,000,000km <sup>2</sup>



# Micronet Solutions Authorized Partners - INDIA



Planet Labs

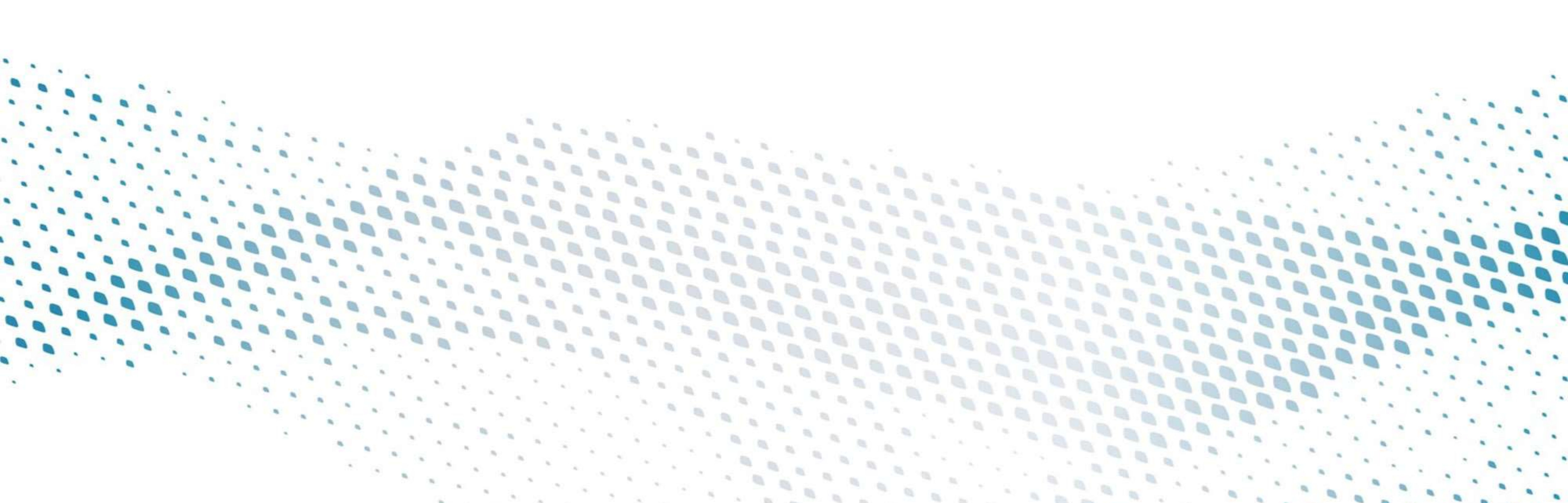


Airbus Defence and Space  
Intelligence Portfolio



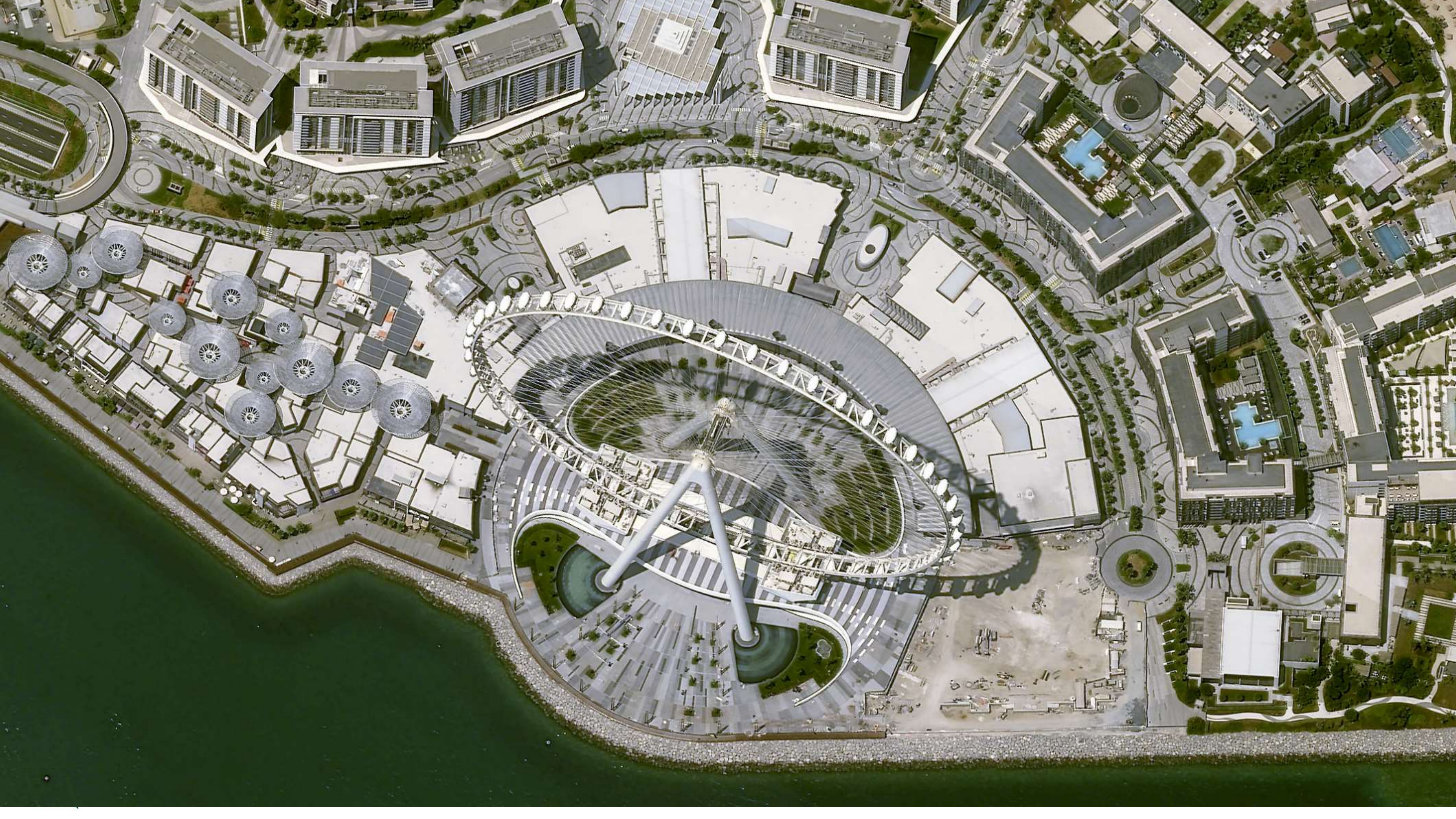
MDA SPACE  
RADARSAT CONSTELLATION





# PLEIADES NEO 30cm IMAGERY

**AIRBUS**







New Delhi  
@ 30cm



New Delhi  
@ 30cm



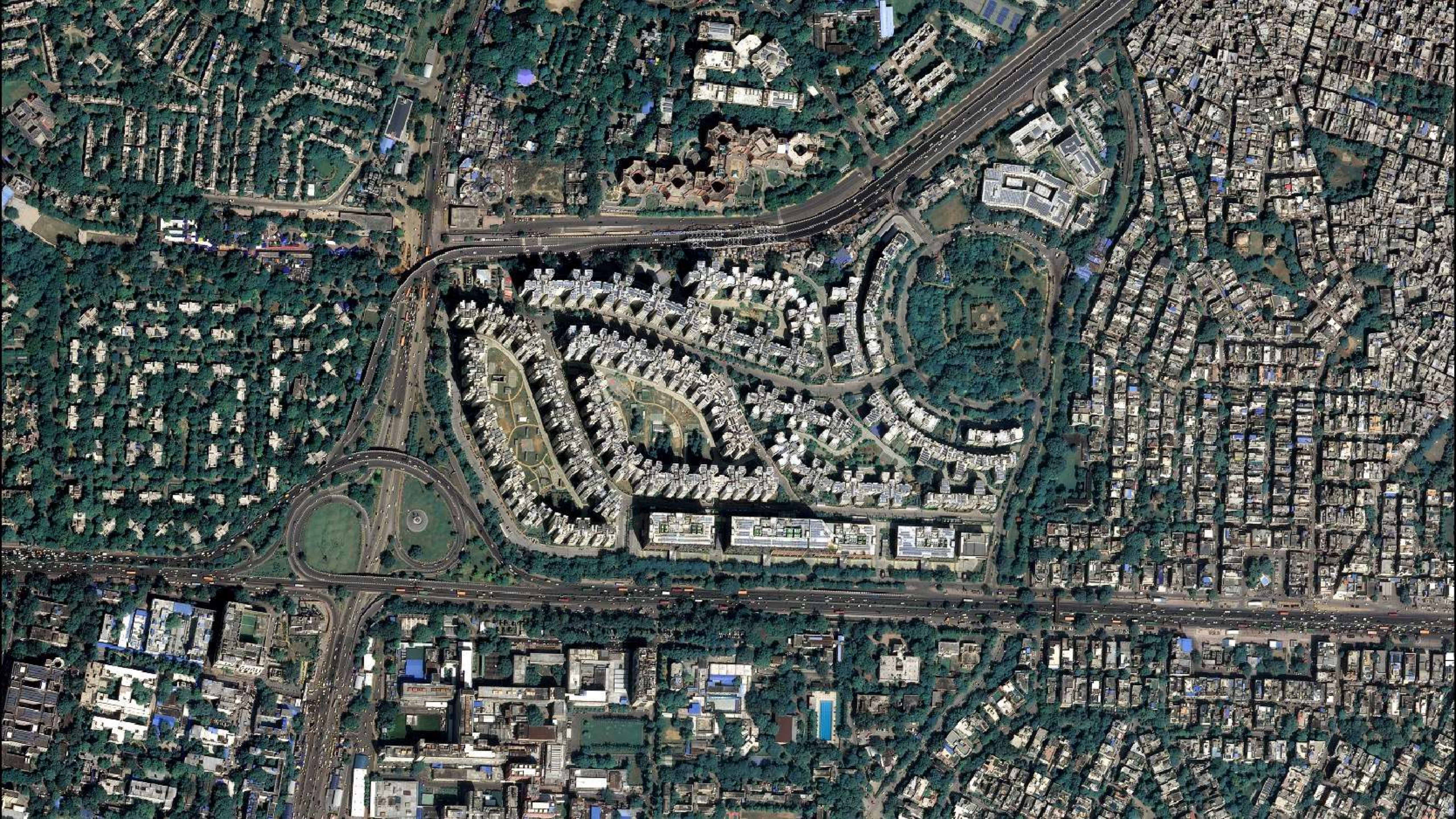


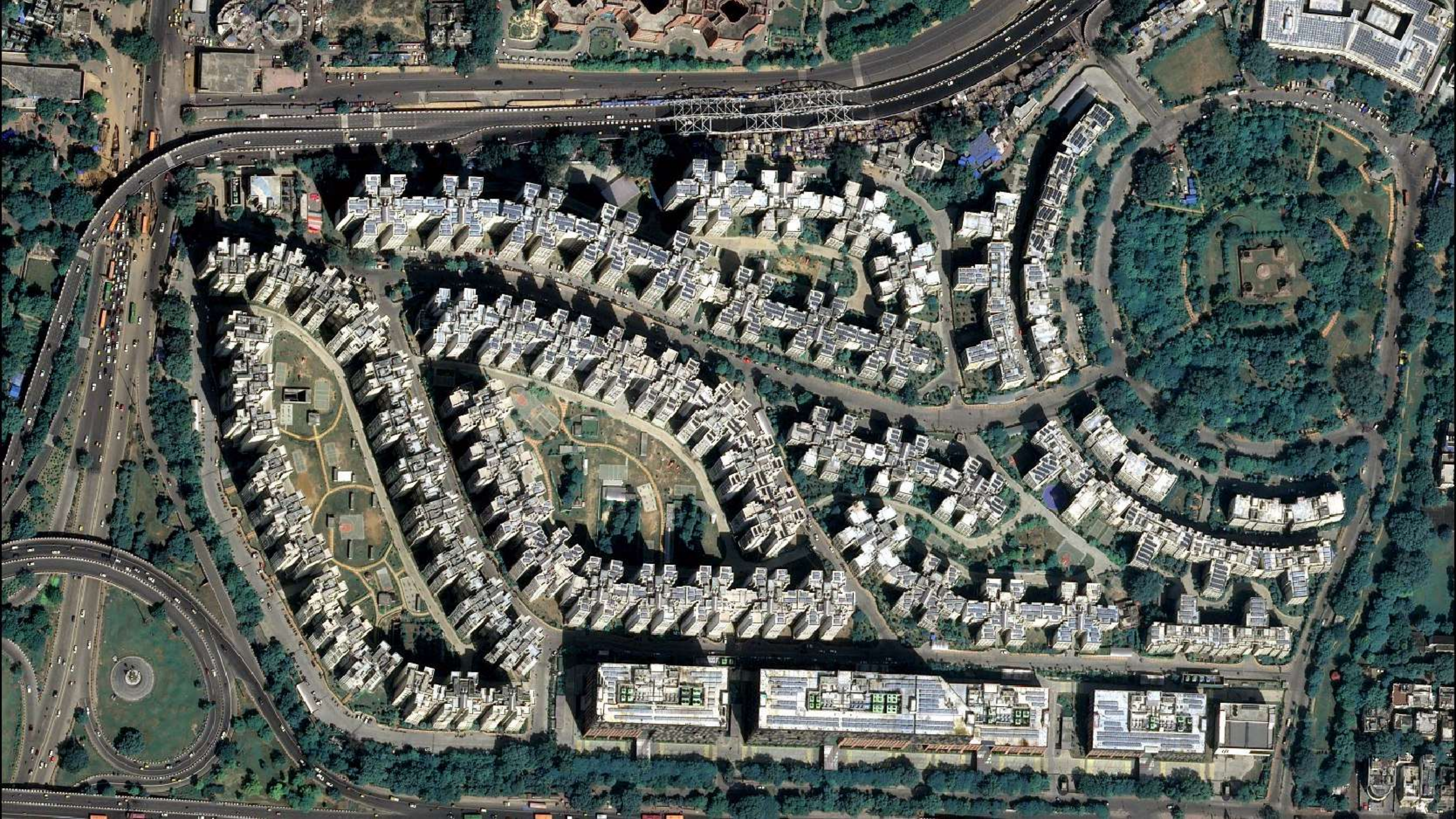




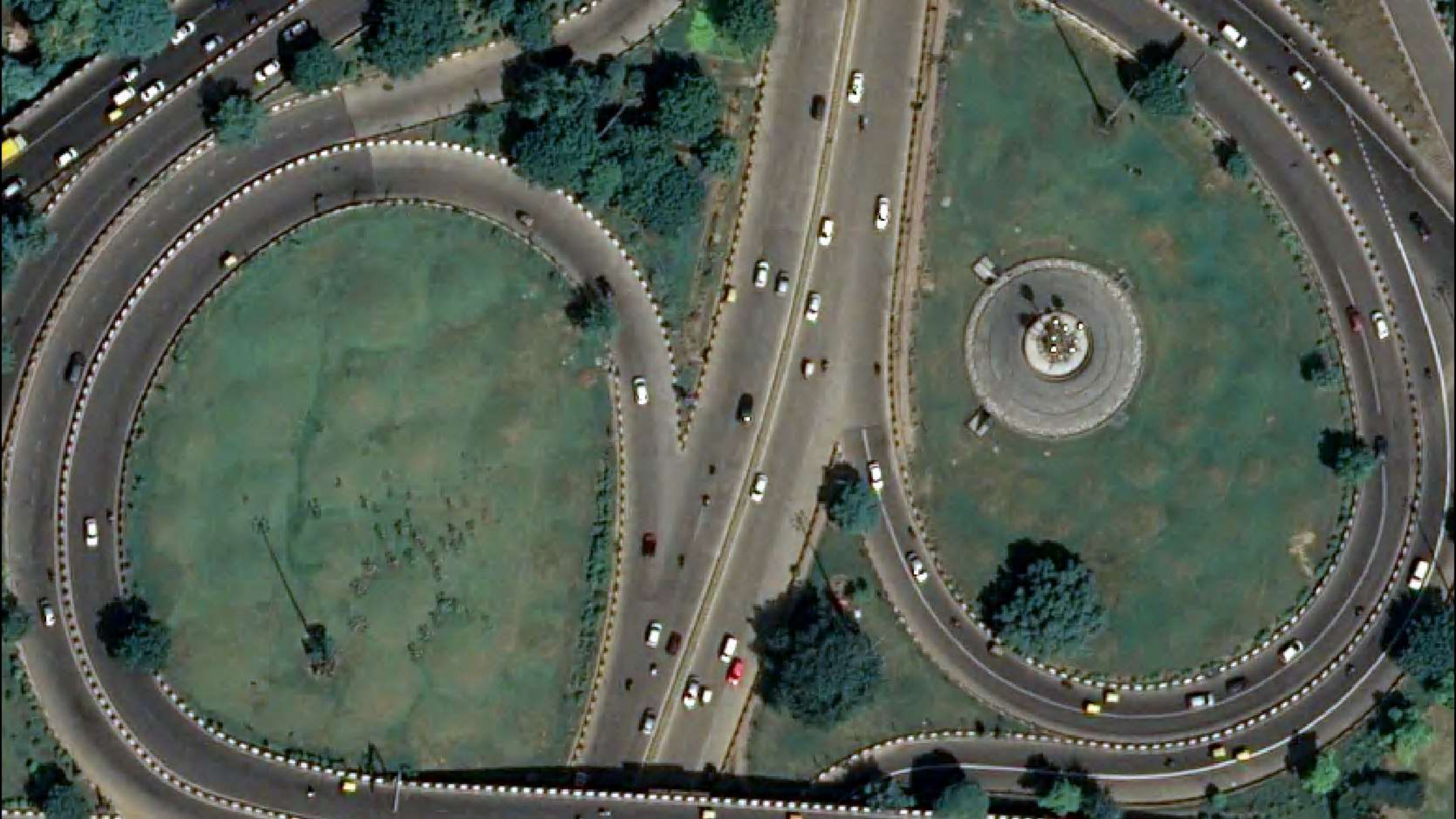
















# PLEIADES NEO – 30cm



4 Identical satellites in constellation



Product Resolutions – 30cm - GSD



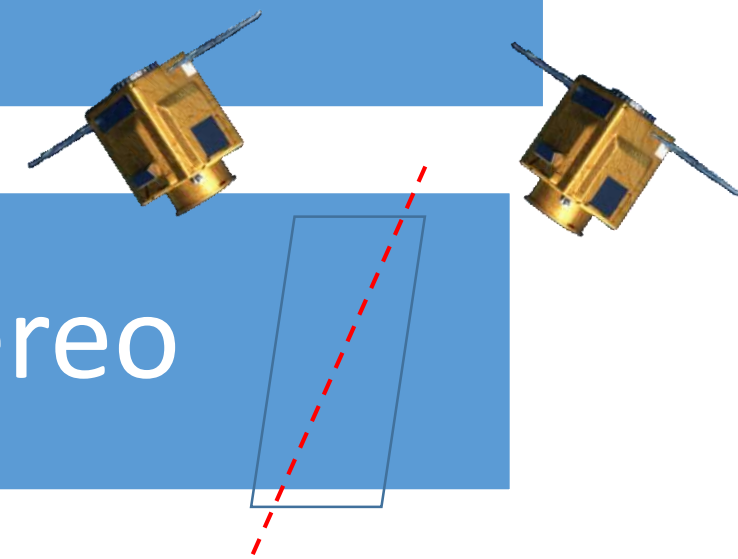
Geo- Location Accuracy- <3.5m

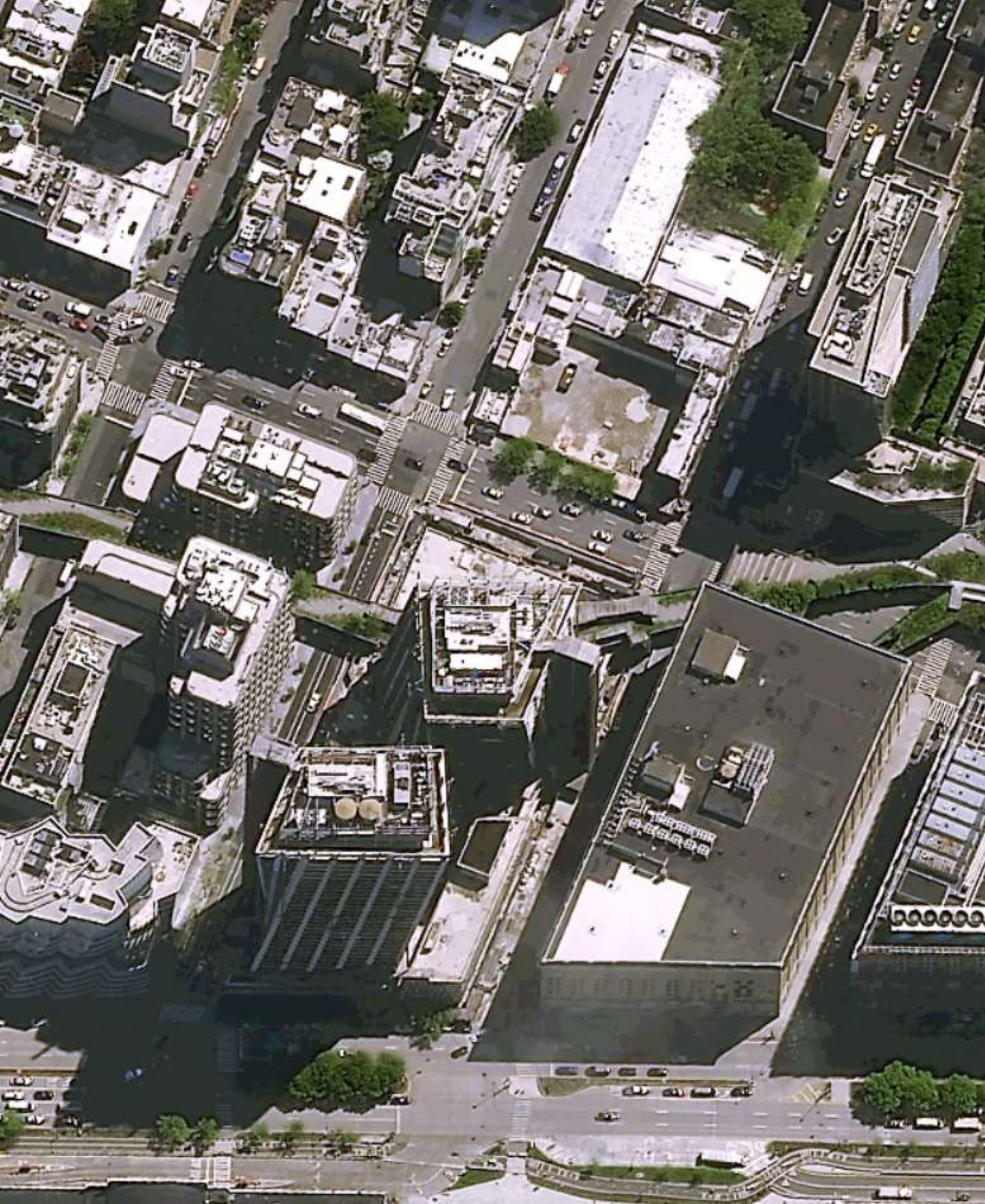


Swath- 14 Kms



Single-Pass: Stereo / Tri-Stereo





# PLEIADES NEO – 30cm



Spectral Bands : Pan +  
6 Multispectral Bands



Cloud Cover <10%



Radiometry- 12 bits



Large Capacity for data collection :  
100% available for commercially



Capacity: 2 Million Sqkms per day



# High Revisit Capacity

at least twice a day

Regularity of revisit: same time, everyday

Cover the entire globe, even at extreme latitudes

Organized in quadrature

**10:30 LTDN**

for a intraday revisit anywhere





# Reactive Tasking & Delivery

15 plans / satellite / day

Customer request up to 15 min before plan upload

Time to acquire: 20-50 min

**TASKING PLAN  
UPDATED EVERY  
MINUTES** **25'**



## Unrivalled Low Cloud Cover

- Accurate weather forecast updated at and for each orbit.

We provide 10% Cloud cover.

<10%  
CLOUD COVER  
TARGET FOR 70% OF IMAGES



# Global coverage capacity

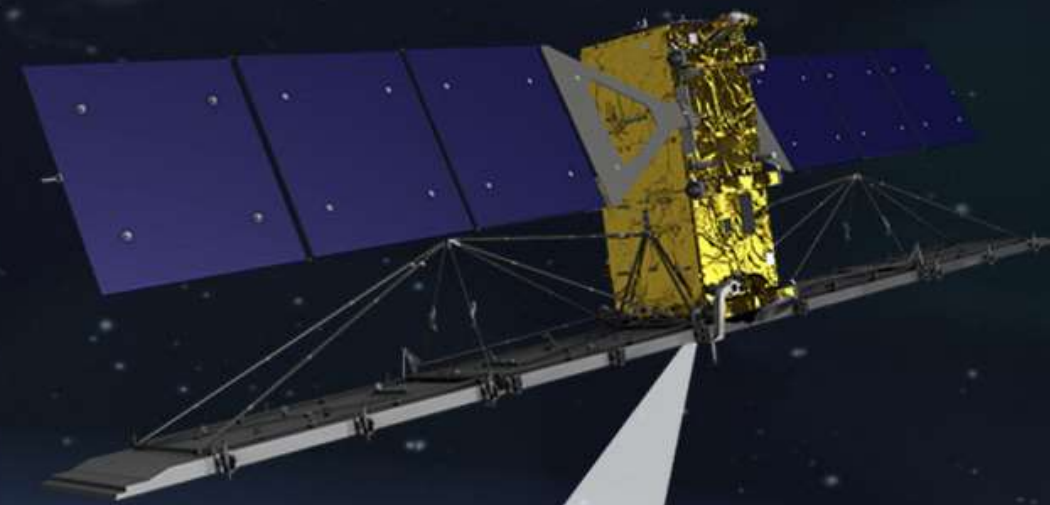
- ▶ 2 Million km<sup>2</sup> every day!
- ▶ Up to 7,500 km<sup>2</sup> in a single pass
- ▶ Up to 15,000 km<sup>2</sup> of consistent coverage within a day

UP TO  
**2 million km<sup>2</sup>**  
EVERY DAY

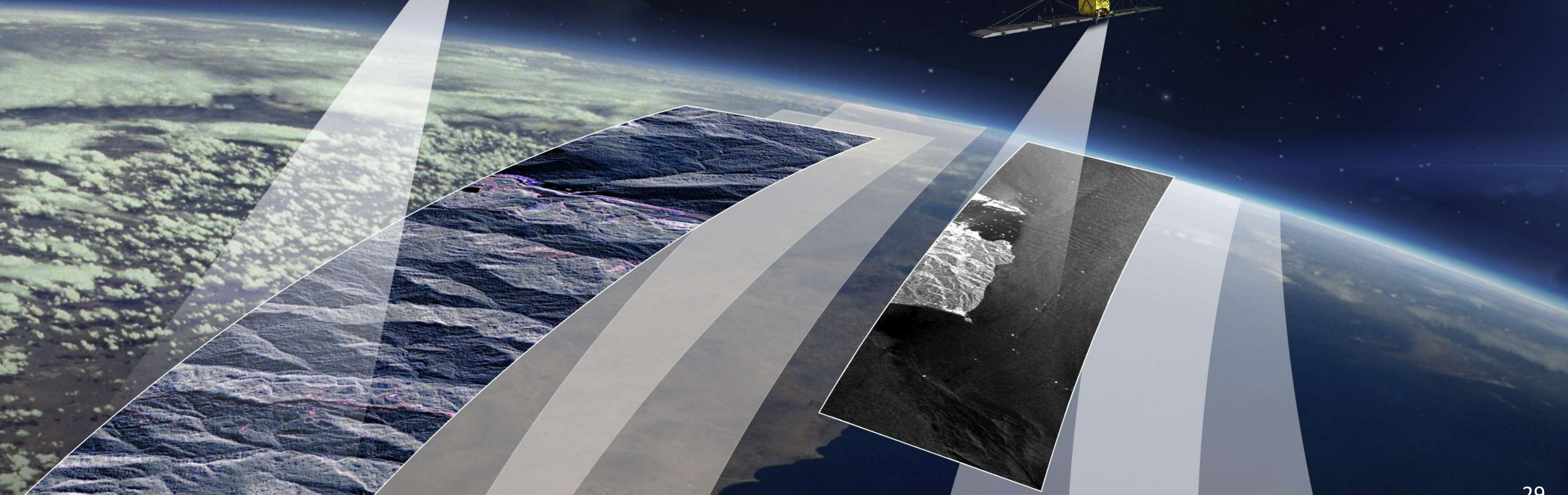
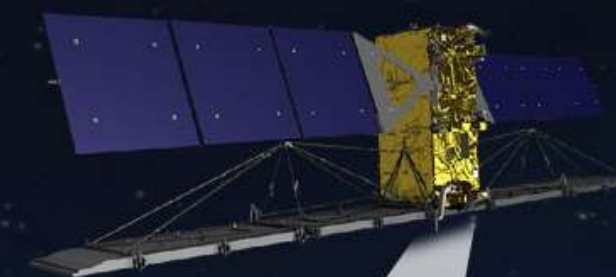


# Efficient Multi-Source Maritime Monitoring

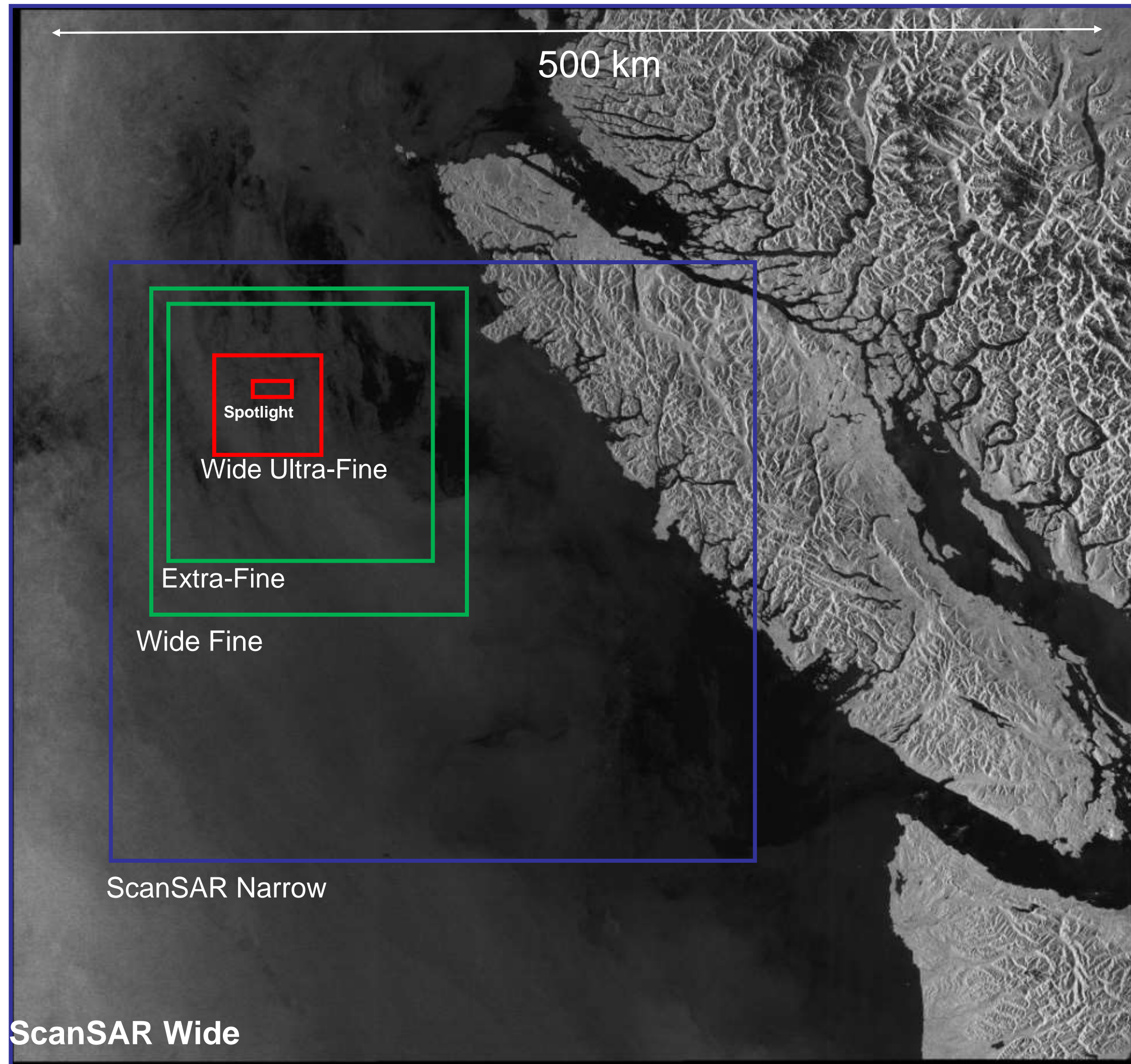
RADARSAT-2



VDS Supports Multi-Source Radar



# Examples of Different Beam Modes' Coverage



ScanSAR Wide  
~100 m resolution  
500 x 500 km

ScanSAR Narrow  
~60 m resolution  
300 x 300 km

Maritime Surveillance

Wide Fine  
~8 m resolution  
150 x 170 km

Extra-Fine  
~5 m resolution  
125 x 125 km

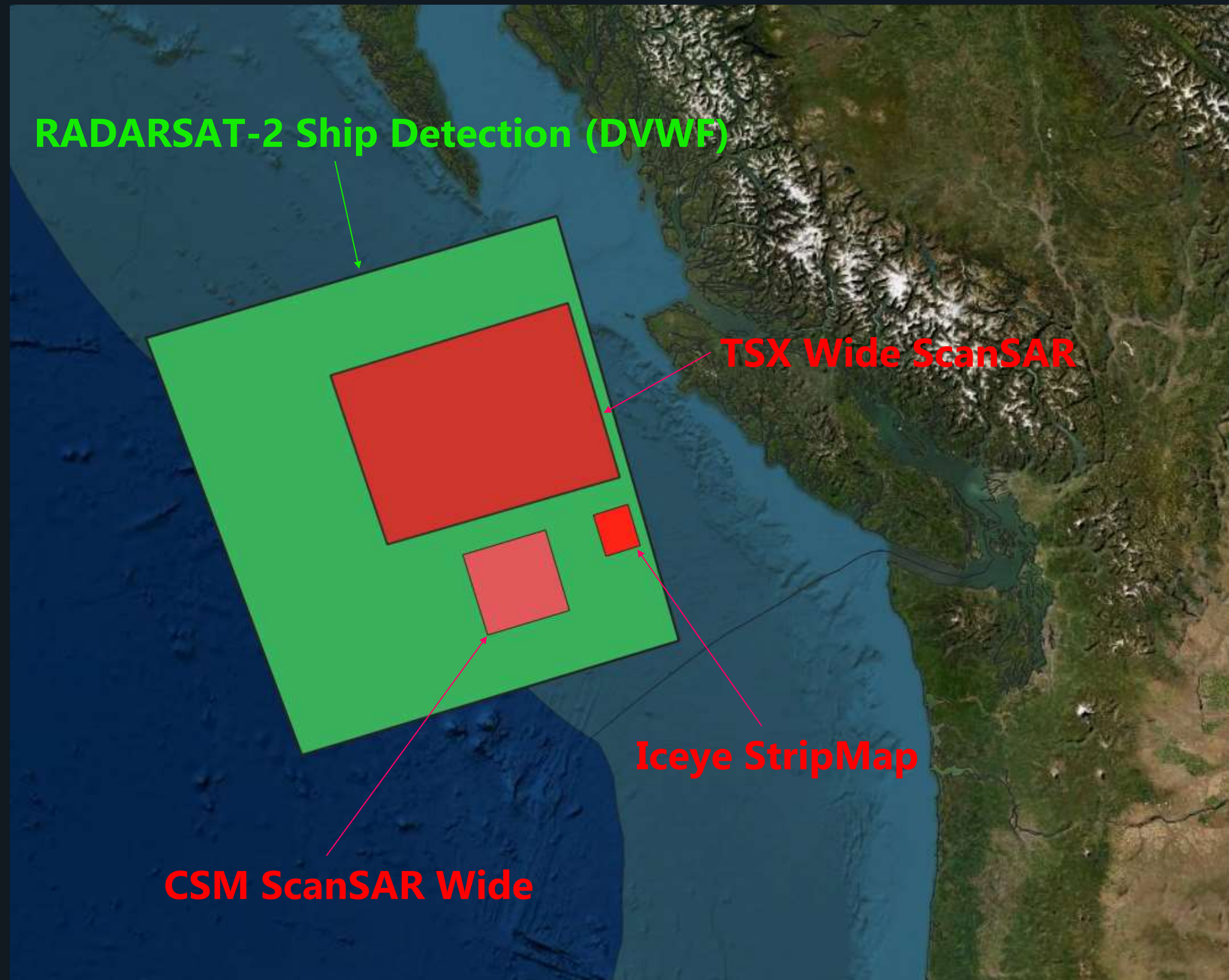
Wide Area Surveillance

Wide Ultra-Fine  
~3 m resolution  
50 x 50 km

Spotlight  
~1 m resolution  
18 x 8 km

Site Monitoring

# Why RADARSAT-2 For Maritime?



## 1. Scene Size and Quantity

SAR Sensor	Qty
RADARSAT-2 DVWF	1
TSX Wide ScanSAR	>4
CSM ScanSAR Wide	>22
Iceye	>150

## 2. Extreme Flexibility: High Resolution, Broad Area

## 3. Near Real Time Downlink & Delivery, Less Than 4hr Delivery

## 4. Flexible Tasking & High Reliability

# MDA Maritime Insights Platform

## Empowering Intelligence-Led Operations

Contact: Mark Carmichael, Director of Product, MDA

Mark.Carmichael@mda.space

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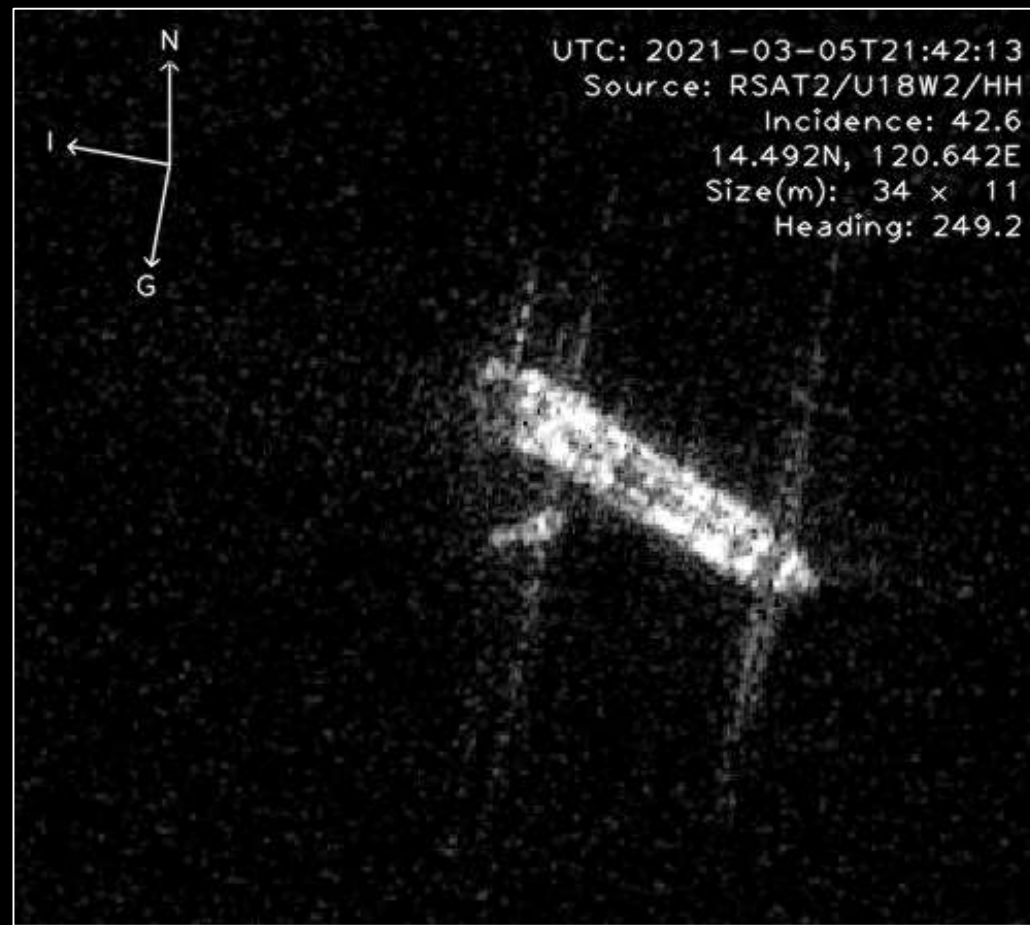
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# Multi-Layered Surveillance



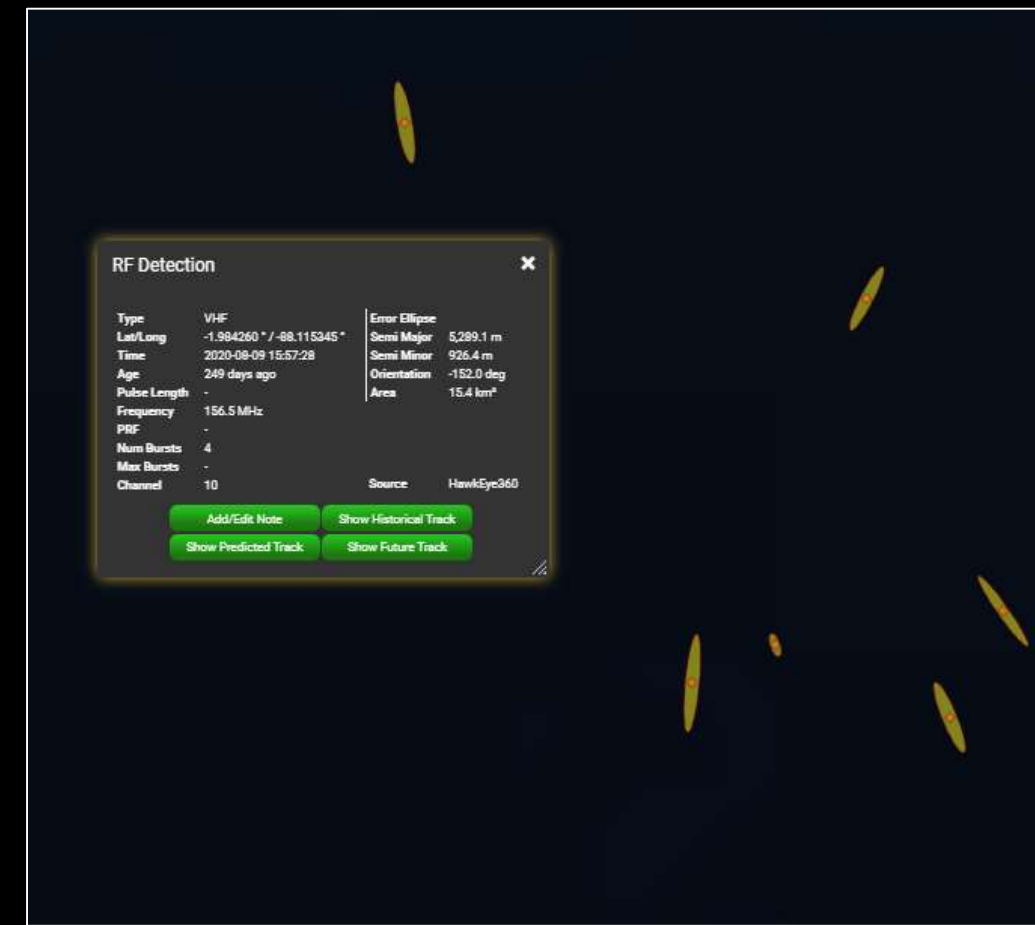
Sensor agnostic support enables frequent vessel detection and monitoring in any weather



## SAR Detections

Detect vessels and oil spills through clouds/day or night using an active synthetic aperture radar sensor

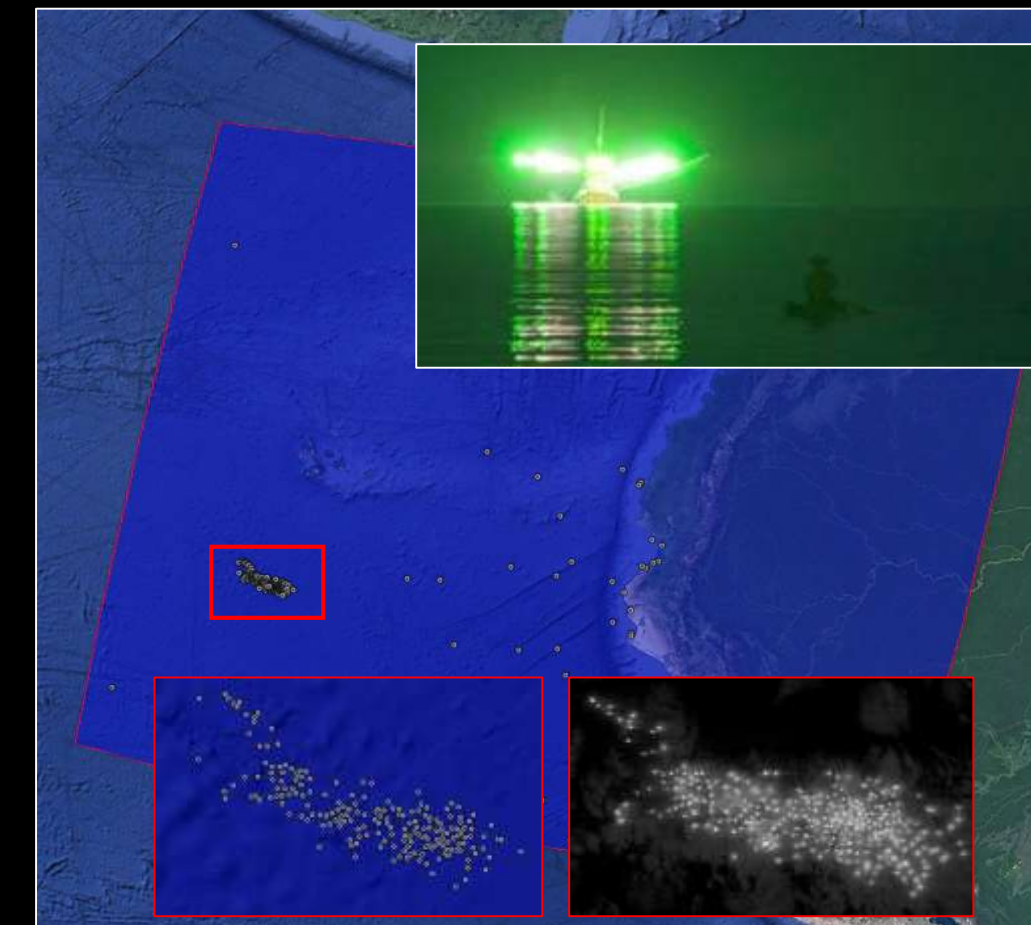
**Sources:** RADARSAT-2, RCM, Iceye, SAOCOM



## RF Detections

Detect common maritime radio frequency (RF) transmitters through passive space-based sensing

**Sources:** HE360, Unseen Labs, KLEOS



## Find Vessels At Night

Detect “Dark Vessels” from their emitted lights such as fishing, tanker, cargo and other vessels

**Sources:** NASA/NOAA



## Optical Detections

Use multi-source optical to detect vessels more frequently and identify/classify vessels of interest

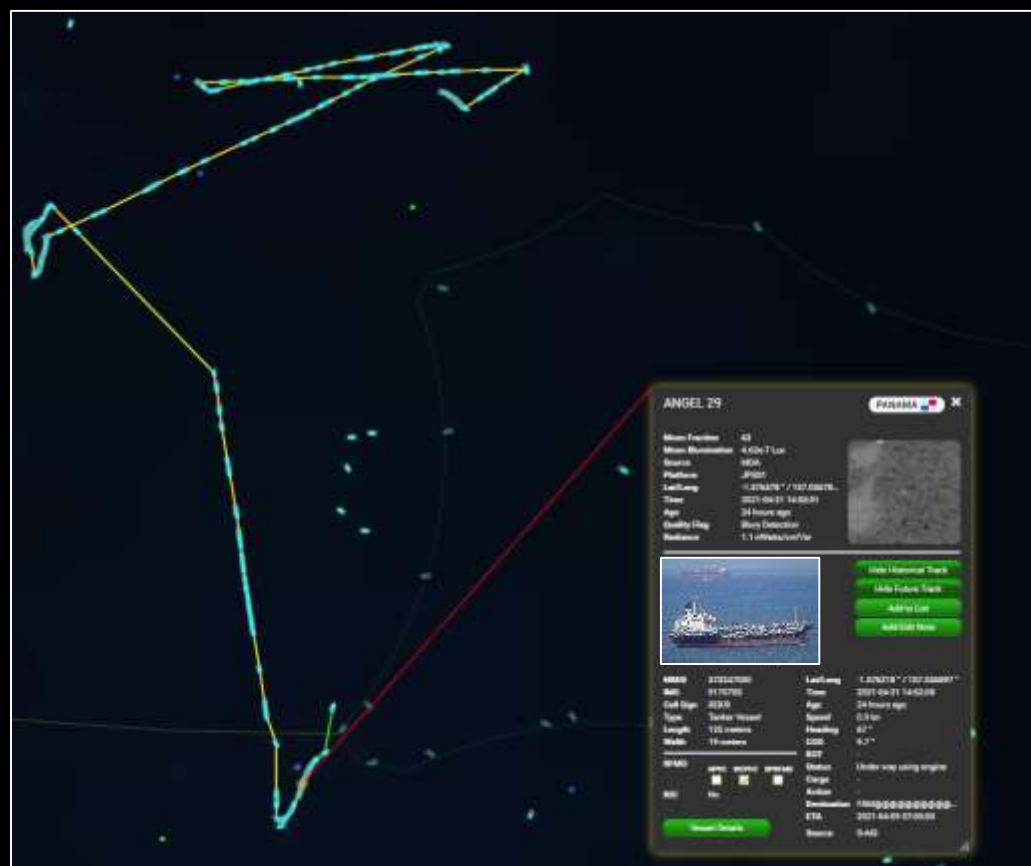
**Sources:** Pleiades , Planet, BlackSky, Satellogic, Sentinel-2

*\*Reflective of End of Q1 2022 Planned Capabilities*

# Multi-Source Analytics

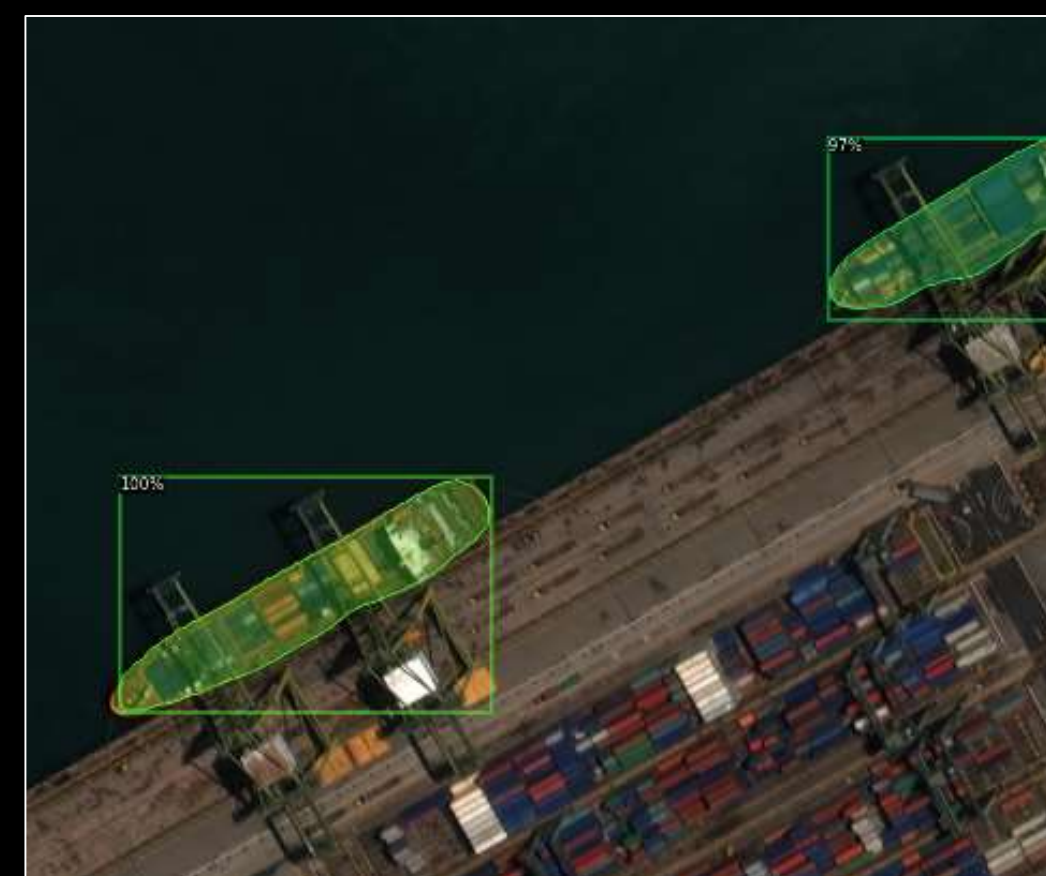


Analytics extract Vessels of Interest (VOI) automatically, alleviating operator overload.



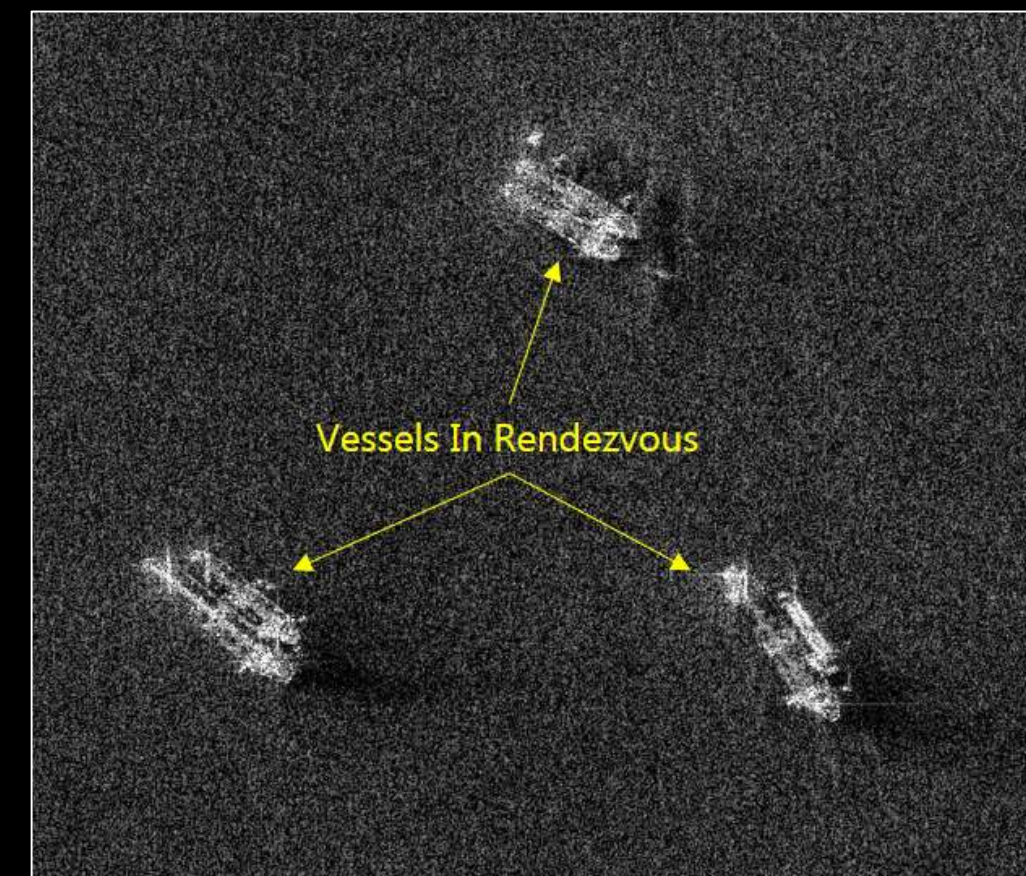
## Find AIS Misuse

Find and inspect automatic identification system (AIS) data interruption and spoofing against other forms of detection



## Recognize Vessels

Use multi-source and ML and vessel knowledgebase to automate vessel recognition & tracking



## Detect Behaviors

Find behaviors of interest using multi-source sensing and Machine Learning (ML) such as rendezvous detection

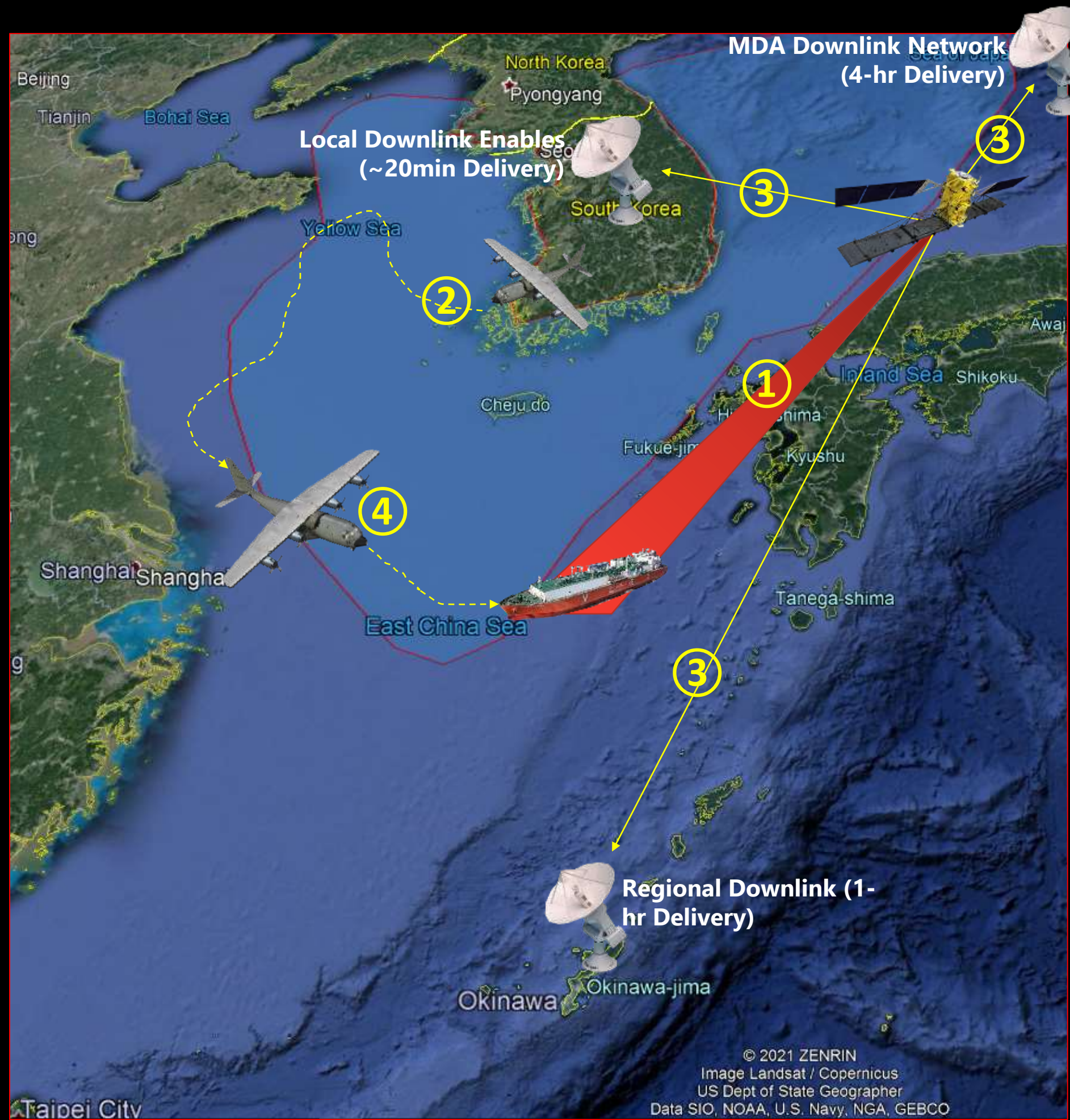


## Monitor Port Activity

Track fleet deployment and assess threats in all weather by using SAR, Optical & ML to track port activity

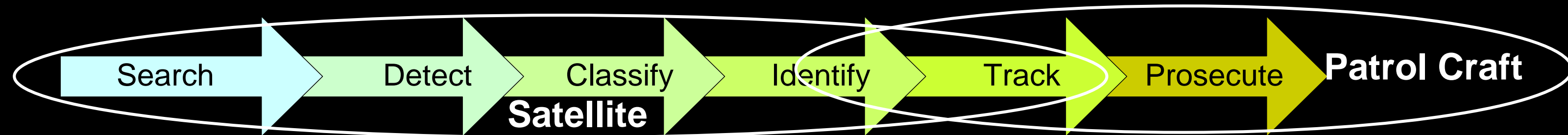
# Operationally Responsive – Cueing Aircraft

*Cueing patrol assets based on new information from overhead satellite passes*



- ① **0545** SAR satellite passes overhead and images a 450 km x 1500 km region, regardless of weather. Imagery is downlinked to MDA stations.
- ② **0930** Maritime Patrol Aircraft (MPA) takes off and flies towards region of satellite coverage
- ③ **0945** Vessel detection information downlinked, processed and displayed in Maritime Insights in Near Real-Time (4 hour delivery is standard, up to 1 hour available upon request). Detections fused with AIS/VMS and other analytics to detect “dark targets” requiring interception.
- ④ **1000** Targets are relayed by user to the MPA, including location, estimated size, classification, threat level and velocity of ships. P3 patrol aircraft vectored to investigate unknown vessels

*\* Insights can be delivered in less than 20 minutes with installed ground station infrastructure*

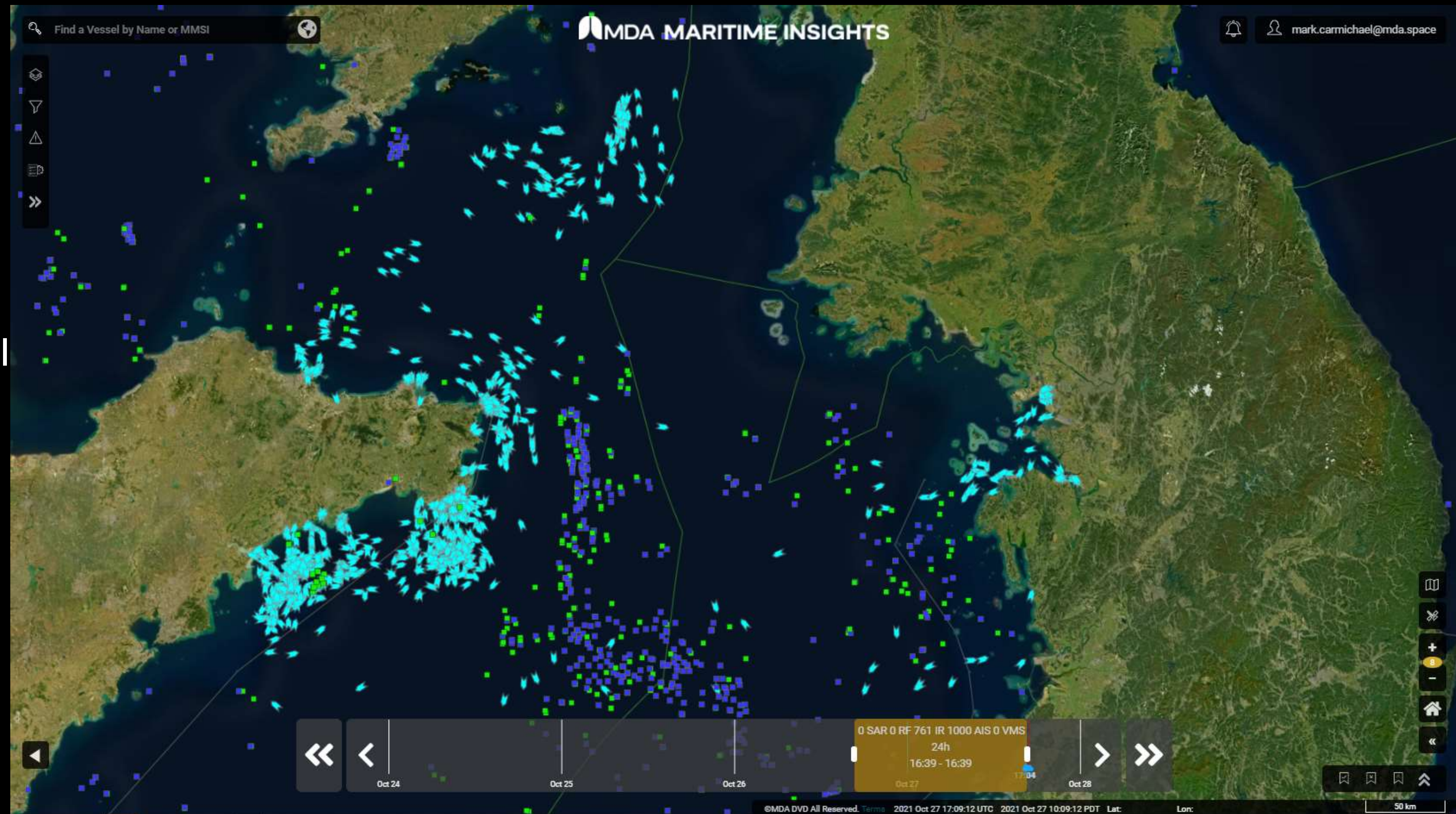


6/22/2022

# Korea Surveillance Example Conops



User monitors their continuous detections from multi-source AIS, VMS, SAR, RF and Optical for the whole AOI via the Maritime Insights Platform



# New Near Real-Time Detections From SAR & VIIRS

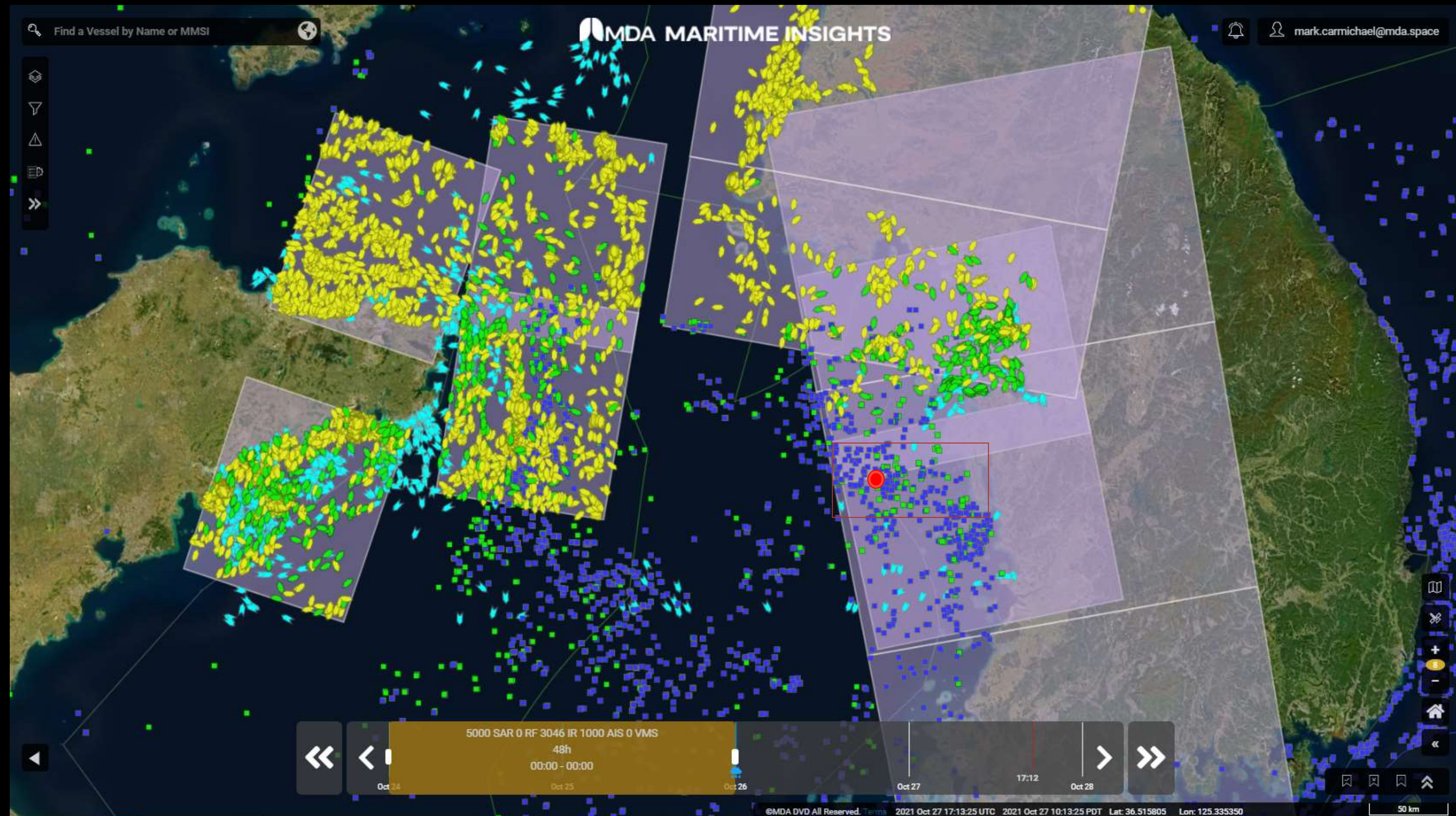


New detections are received within 1-4 hours of acquisition

Detections are automatically extracted and fused with AIS/VMS

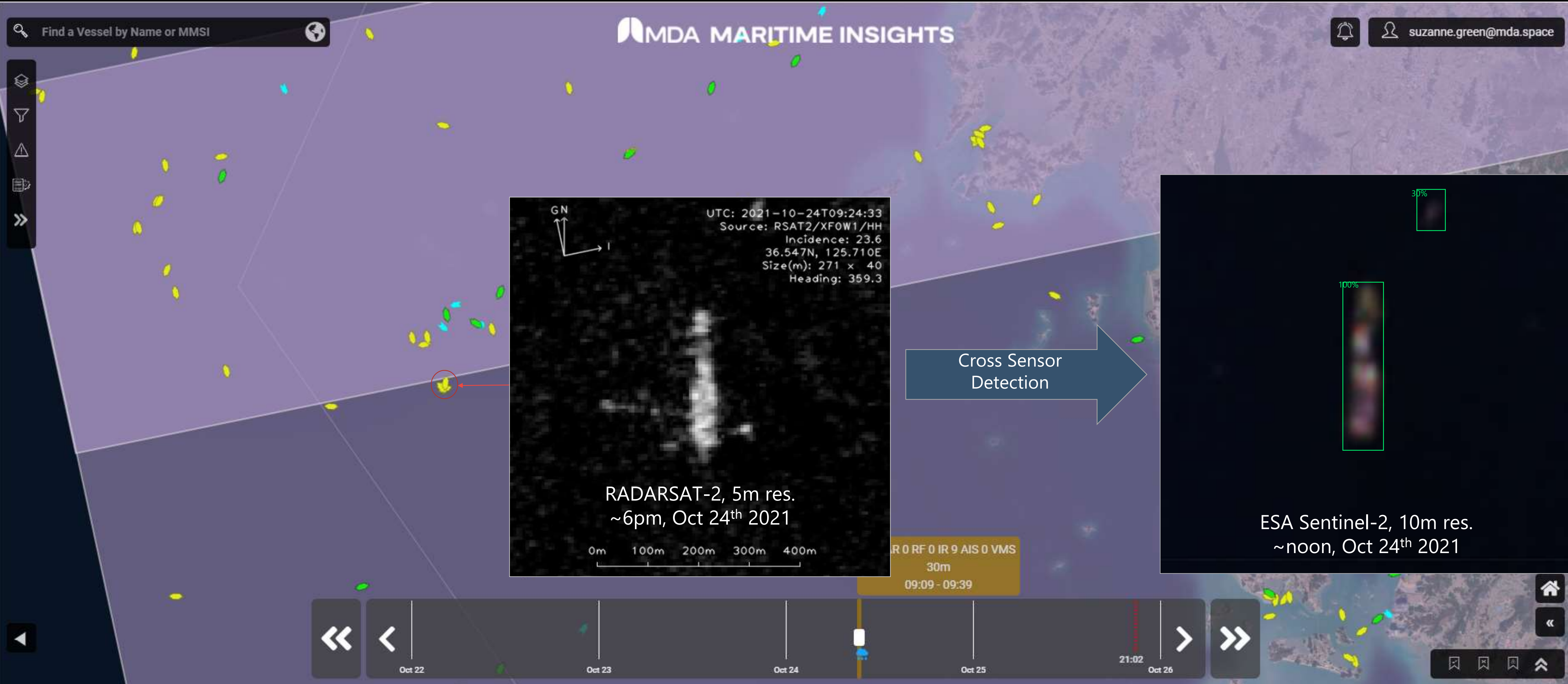
Analytics run to extract behaviors and events

Subscribed behaviors are alerted to User



# Probable Ship To Ship Transfers Detected

West of Taeanhaean, South Korea Oct 24<sup>th</sup> 2021



# Probable Pair Trawling Detected

Korea EEZ, Yellow Sea, Oct 24 2021



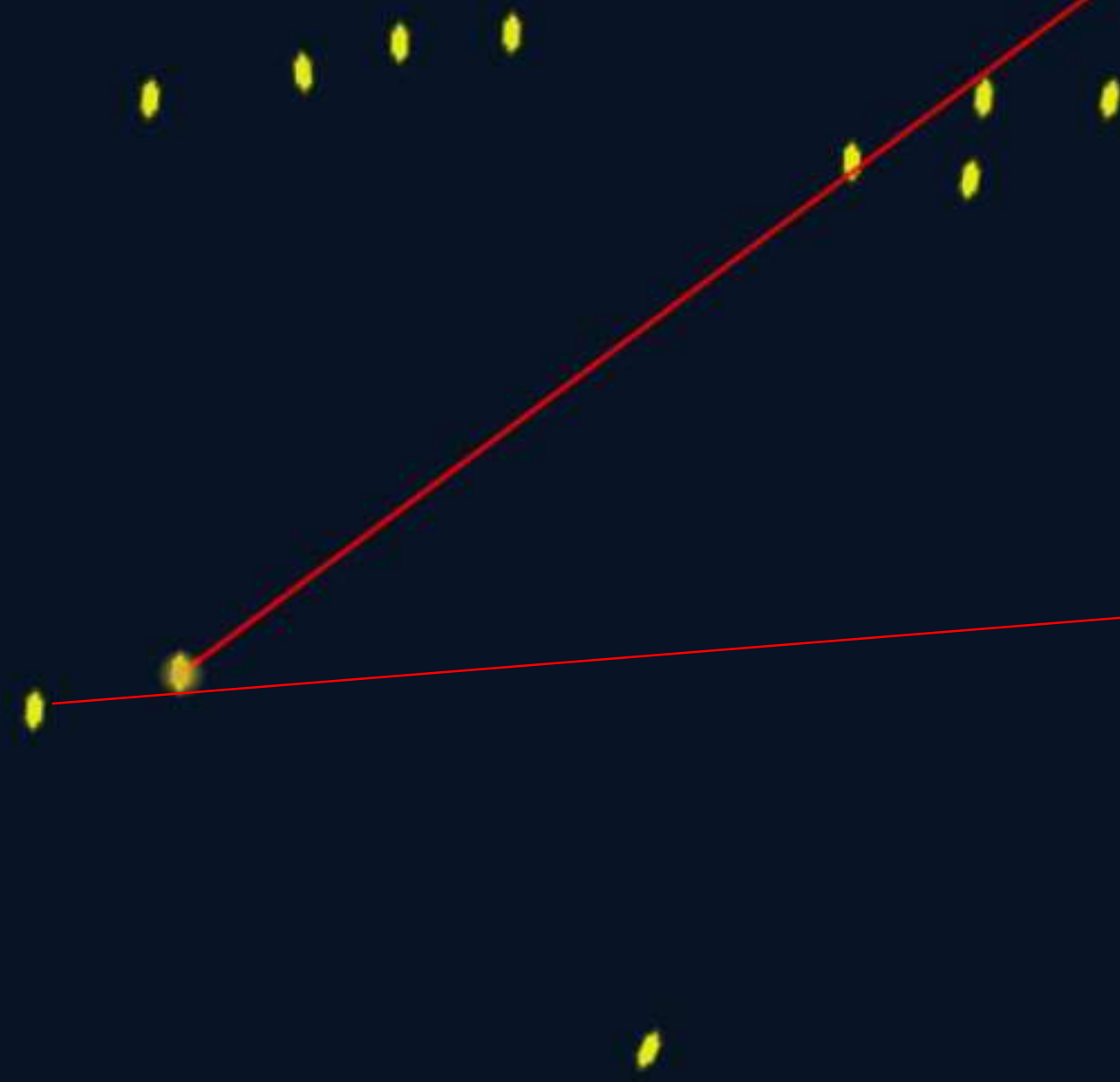
Find a Vessel by Name or MMSI

MDA MARITIME INSIGHTS

Vessels

Trawl Net

ESA Sentinel-2, 10m Optical  
~Noon, Oct 24 2021



### RSAT2 Ship Detection

Lat/Long	37.687500 ° / 123.72870...
Time	2021-10-24 21:39:45
Age	16 days ago
Speed	-
Heading	1 / 181 °
Length	50 meters
Width	4 meters
Detection Conf.	0.19
Orientation Conf.	0.99

Add/Edit Note Show Historical Track  
Show Predicted Track Show Future Track

### RSAT2 Ship Detection

Lat/Long	37.686490 ° / 123.72374...
Time	2021-10-24 21:39:45
Age	16 days ago
Speed	-
Heading	5 / 185 °
Length	20 meters
Width	12 meters
Detection Conf.	0.31
Orientation Conf.	0.48

Add/Edit Note Show Historical Track  
Show Predicted Track Show Future Track

12 SAR 0 RF 3 IR 0 AIS 0 VMS  
48h  
00:00 - 00:00

Oct 24 Oct 25 Oct 26 Oct 27 Oct 28

1000 m

# Broad Area To High Resolution Tip & Cue

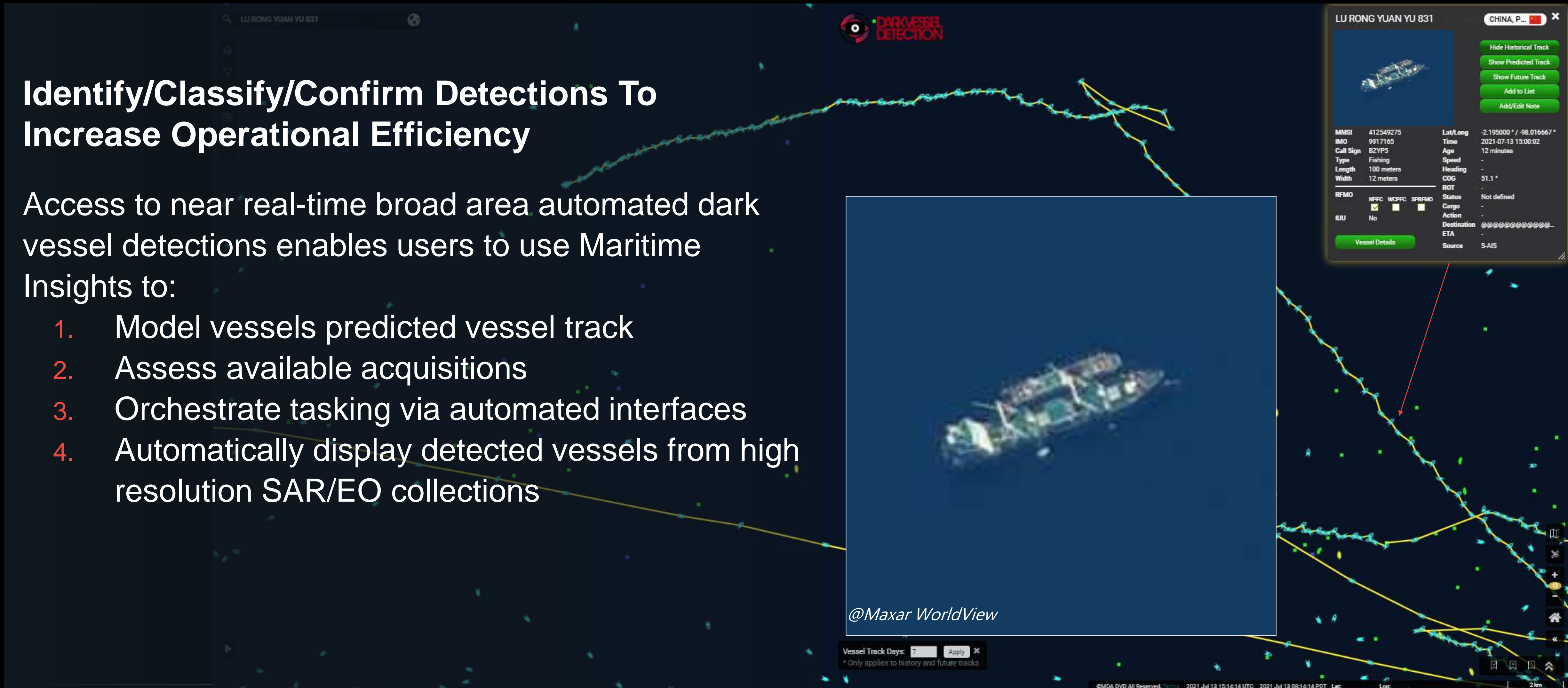
## Identify/Classify/Confirm Detections To Increase Operational Efficiency



### Identify/Classify/Confirm Detections To Increase Operational Efficiency

Access to near real-time broad area automated dark vessel detections enables users to use Maritime Insights to:

1. Model vessels predicted vessel track
2. Assess available acquisitions
3. Orchestrate tasking via automated interfaces
4. Automatically display detected vessels from high resolution SAR/EO collections

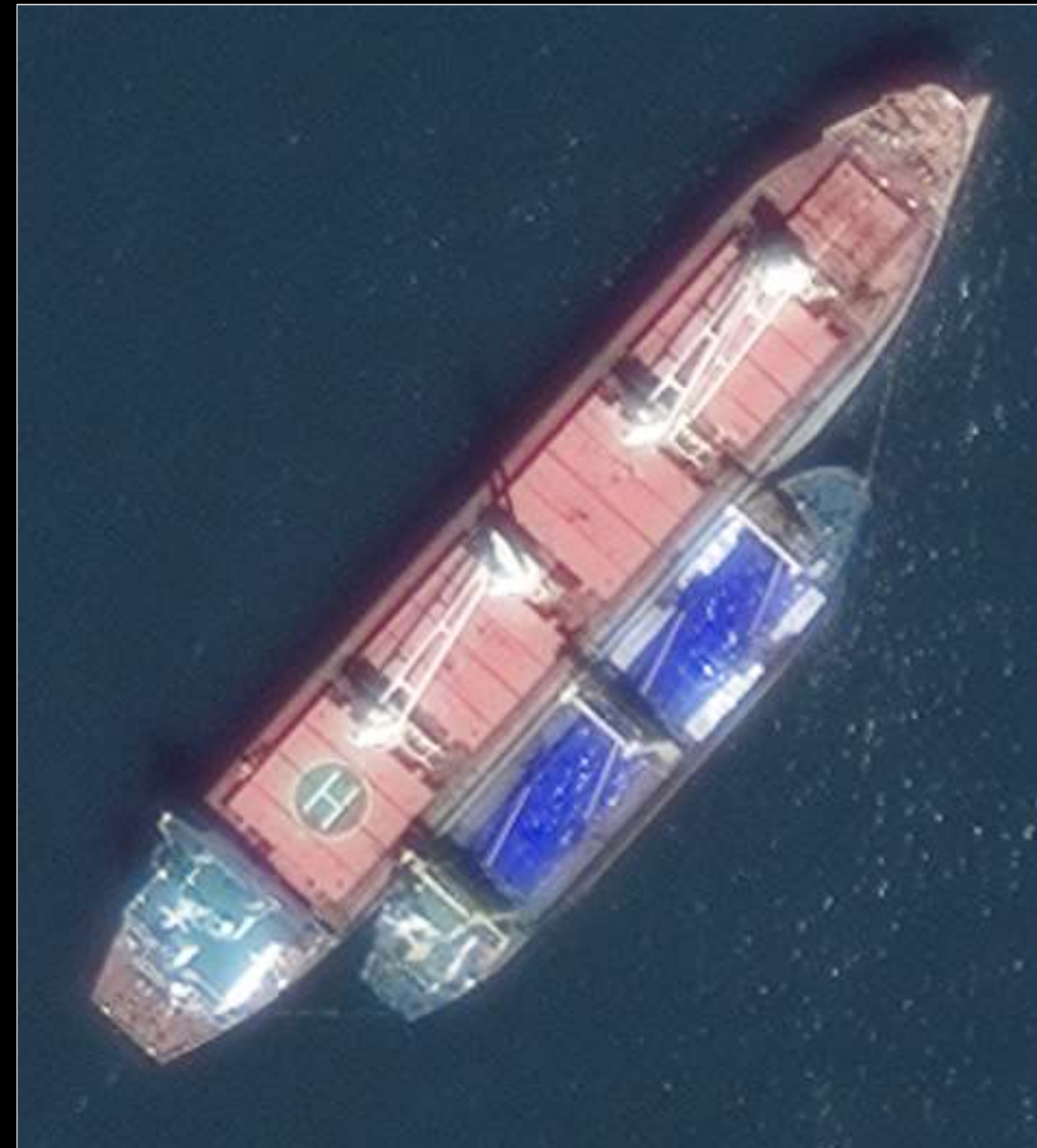


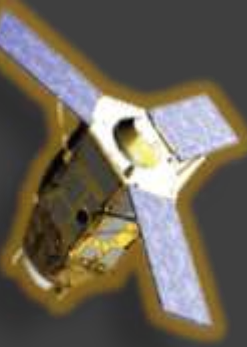
# Detecting Potential Illicit Transfers

## West of Nampo (North Korea) Harbour Entrance August 22<sup>nd</sup> 2021



- On a single day Maritime Insights found 9 vessels in ship to ship transfer of various kinds (fishing, cargo, etc) – single WorldView image.
- This capability scales to cover many ports daily, multiple times per day using multiple sources of high resolution EO/SAR data.





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