



Always On Monitoring for Defense and Intelligence: Delivering Automated Analytics and Insights at the + Speed of Change

Partha Pratim Ghosh • June 14-15, 2022

EVER GIVEN • Suez Canal, Egypt • March 28, 2021

Agenda



1. Planet Overview
2. Planet in Defense & Intelligence Value Chain
3. Defense & Intelligence Use Cases
4. Planet Analytics Feed
5. Q & A





We provide the solution

Planet images the whole world every day, making change **visible, accessible, and actionable.**



Planet's industry-leading constellations

~200

PlanetScope Dove Satellites



Doves



SATELLITES
~200

GSD
3.7 m

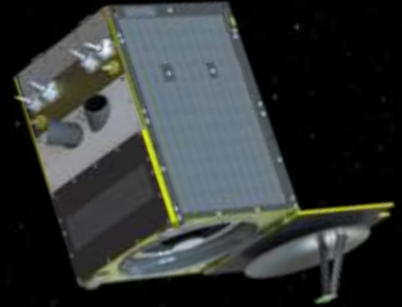
CAPACITY
300 million km²/day

ORBIT ALTITUDE
475 km

8 SPECTRAL BANDS
**Coastal Blue, Blue,
Green I, Green II
Yellow, Red, Red Edge,
Near Infrared**

21

SkySat Satellites



SkySat



SATELLITES
21

GSD
0.5 m

CAPACITY
4,000 targets/day

ORBIT ALTITUDE
450 km

SPECTRAL BANDS
RGB, PAN and NIR



What drives value for our customers interested in Foreign Military Intelligence & Contingency Planning?



Global Daily Coverage

Increased situational awareness by seeing “everywhere” and “all the time” - can help anticipate danger



Daily Collection Assurance

Daily collection assurance globally without the need for tasking



Automatic Change Detection

Decrease manual labor, save time to get to insights

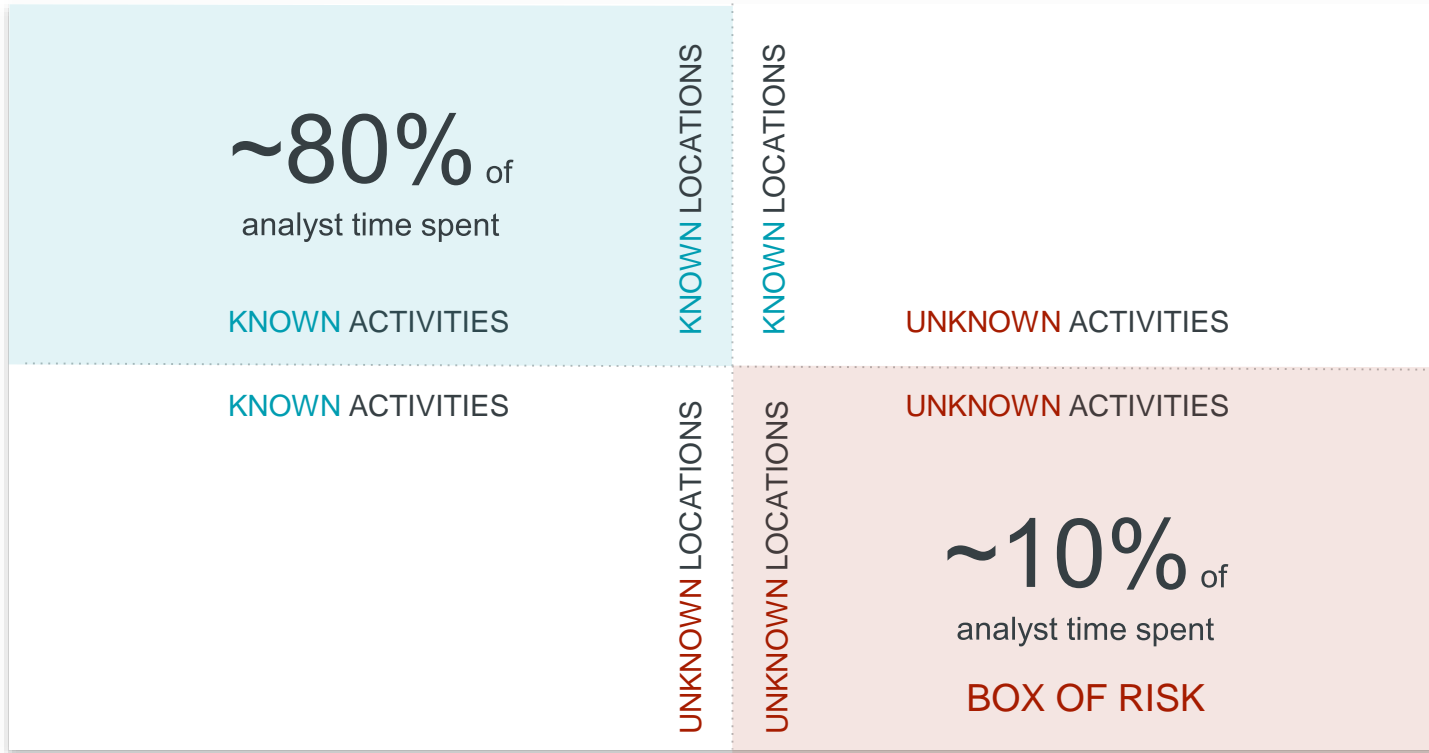


Tip & Cue

The diversity of our assets can be integrated into effective tip & cue workflows




GEOINT in practice



Statistics are approximations only



An aerial photograph of a glacier, showing a mix of white ice, dark brown rocks, and patches of blue water. A large, semi-transparent dark blue rectangle is overlaid on the center of the image, containing white text. In the top-left corner of the image, there is a white crosshair symbol.

We think there's a better way: Insights at the speed of change



Planet Data Reveals Critical Geopolitical Developments

US Strategic Command @US_Stratcom

This is the second time in two months the public has discovered what we have been saying all along about the growing threat the world faces and the veil of secrecy that surrounds it.



nytimes.com
A 2nd New Nuclear Missile Base for China, and Many Questions About Strate...
Is China scrapping its "minimum deterrent" strategy and joining an arms race? Or is it looking to create a negotiating card, in case it is drawn into arms ...

3:28 PM · Jul 27, 2021 · Twitter Web App

419 Retweets 137 Quote Tweets 856 Likes

"the Federation of American Scientists (FAS), a research group, said it had spotted China building as many as 110 silos for intercontinental ballistic missiles (ICBMs) near the city of Hami, in eastern Xinjiang (see picture). A month earlier, the James Martin Centre for Nonproliferation Studies, an NGO in California, had identified 120 silos being built in Yumen, in the desert of Gansu, a neighbouring province. Both outfits found the sites by poring over satellite imagery from Planet, an American firm."

The Economist



Menu

Weekly edition



Search

China

Jul 31st 2021 edition >

Select your shell

China is rapidly building new nuclear-missile silos

The Washington Post

Commercial satellites — not U.S. intelligence — revealed China's missile program





MISSILE SILO CONSTRUCTION

Gansu Province, China
January 23, 2021

Source: Planetscope

Seemingly overnight, a network of roads and regularly-spaced buildings sprung up on an expanse of barren gravel near Yumen, China. The structures match the appearance of missile silos under construction in other locations in China, and analysts believe the complex is intended to house the DF-41 intercontinental ballistic missile.

These images show the site January 23, March 20, and June 6, 2021. In the January image a lone road runs north to south across snow-filled gullies. By March 20 several new roads cut across the landscape, along with a handful of light-colored rectangles. On June 9 construction was well underway, with the widening of several roads and the appearance of structures.

Roughly 100 silo sites have appeared since construction began around January 2020, spread across an area of about 3,000 square kilometers (1,200 square miles). Planet's medium-resolution satellite constellation provides a unique tool to monitor large areas, continuously and without tasking.





MISSILE SILO CONSTRUCTION

Gansu Province, China
March 20, 2021

Source: Planetscope

Seemingly overnight, a network of roads and regularly-spaced buildings sprung up on an expanse of barren gravel near Yumen, China. The structures match the appearance of missile silos under construction in other locations in China, and analysts believe the complex is intended to house the DF-41 intercontinental ballistic missile.

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MISSILE SILO CONSTRUCTION

Gansu Province, China
June 6, 2021

Source: PlanetScope

Seemingly overnight, a network of roads and regularly-spaced buildings sprung up on an expanse of barren gravel near Yumen, China. The structures match the appearance of missile silos under construction in other locations in China, and analysts believe the complex is intended to house the DF-41 intercontinental ballistic missile.

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MISSILE SILO CONSTRUCTION

Gansu Province, China
July 16, 2021

Source: SkySat

Seemingly overnight, a network of roads and regularly-spaced buildings sprung up on an expanse of barren gravel near Yumen, China. The structures match the appearance of missile silos under construction in other locations in China, and analysts believe the complex is intended to house the DF-41 intercontinental ballistic missile.

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15 August 2021



15 August 2021



15 August 2021





Hainan, China • 12 December 2019





B-2's at Diego Garcia South China Sea • Skysat 50cm, 18 August 2020 (11:17 AM Local Time)





H-6 Bombers, Kashgar Airport Xinjiang, China • Skysat 50cm, 13 August 2020





Karachi, Pakistan • 25 February 2020





SUBMARINE AT YULIN NAVAL BASE • Hainan Island, China • Skysat 50cm, 18 August 2020





Comac C919

Woody Island South China Sea • Skysat 50cm, 17 August 2020 (11:23 AM Local Time)





Woody Island South China Sea • Skysat 50cm, 17 August 2020 (1:44 PM Local Time)





New Missions





Meet Pelican

Planet's next-generation satellite constellation for delivering high-resolution, rapid revisit insights – anywhere on the globe.

RESPONSIVE

RAPID REVISIT

HIGHLY PRECISE

INTEROPERABLE



+ A leap forward in capabilities

Expansive
coverage

Up to

30

satellites

Higher daily
revisit

Up to

30

captures
per day

Ultra-fast
acquisition

30

minutes
or less

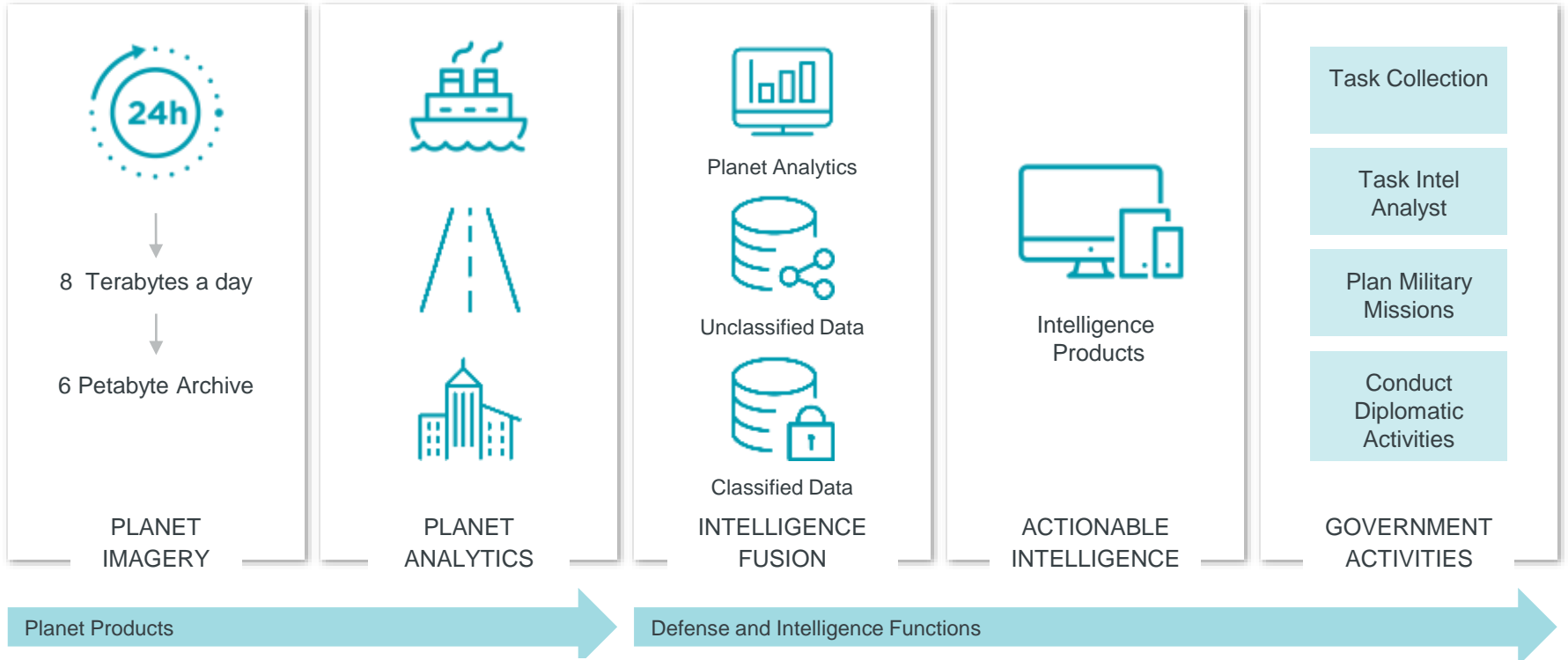
Greater
precision

30

cm
resolution



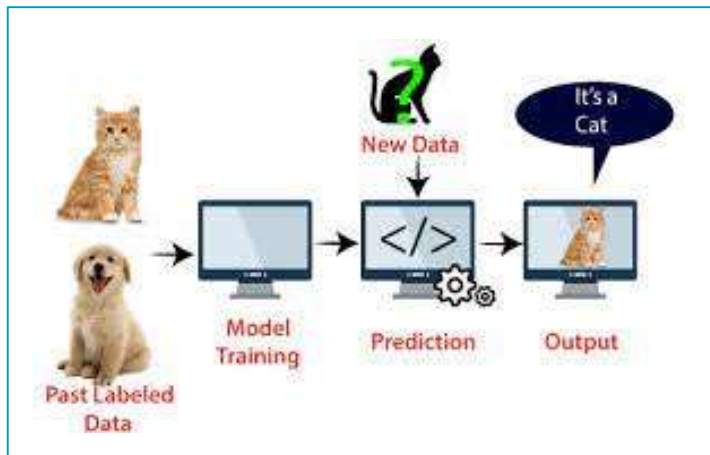
Defense & Intelligence Value Chain



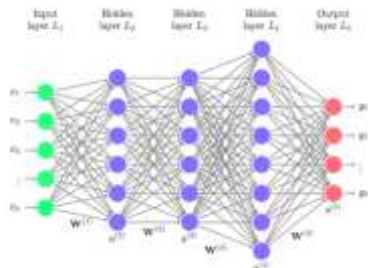


Analytics, AI, ML in Remote Sensing

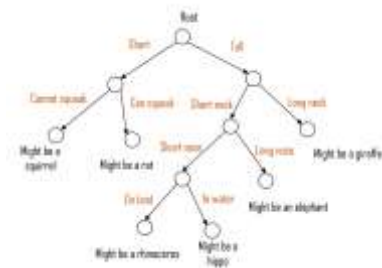
Object detection and classification



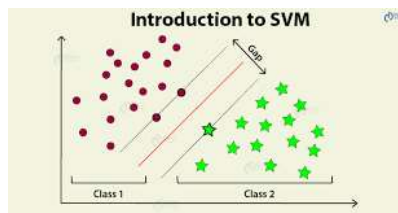
- Algorithms are decades old in all Standard COTS
- Challenges:
 - Training imagery/ Label
 - Processing power of hardware



Deep Learning



Decision Tree



Support Vector Machine



Object based classification

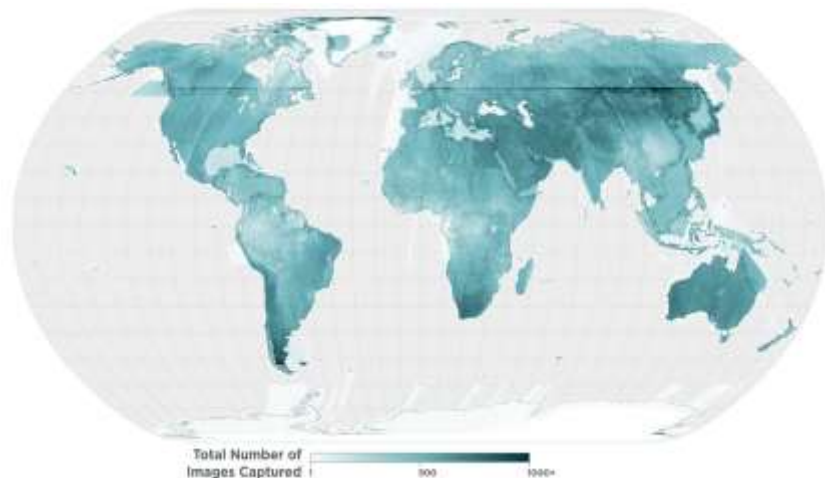




Planet Archive

Petabytes of imagery data at your fingertips

- 2000+ images available for any given location on Earth
- Deep historical context on your areas of interest and deep imagery stacks for analytics and app development
- Train machine learning and computer vision algorithms
- Detect change and assess trends globally
- Access to PlanetScope, RapidEye, SkySat, Landsat, and Sentinel-2 archives





Planet Analytic Feeds

Transform imagery into insights

Object Detection Feeds

Find objects of interest in PlanetScope imagery



Vessel



Aircraft

Segmentation Feeds

Automatically extract features from Planet Basemaps



Road



Building

Change Detection Feeds

Automatically extract changes from series of Planet Basemaps



Road Change



Building Change

+ How do Analytic Feeds work?

1

Develop a model

Models trained to recognize features in imagery

2

Create a Feed

A feed is the blueprint for what processing is required to create Analytic outputs

3

Create a subscription

A set of conditions for when imagery is processed by feed (ie, AOI and TOI)

4

Grant user access to subscription

Allow people to get the Analytic outputs

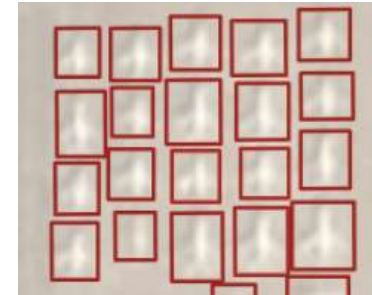
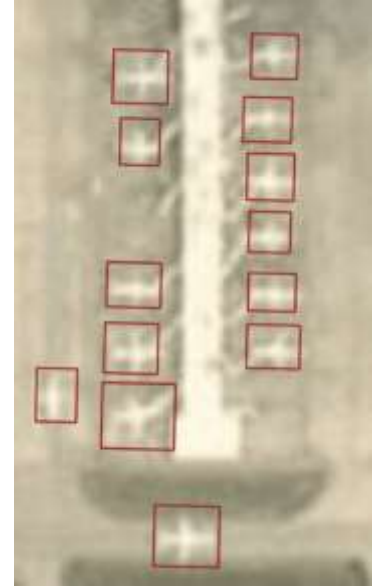
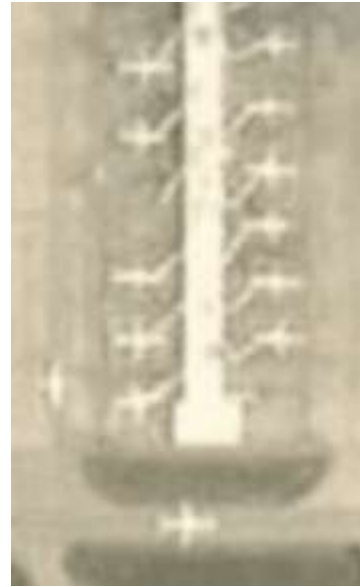


PLANE DETECTION

Object Detection model

Vessel detection on PlanetScope Monitoring

- Input imagery: PlanetScope scenes
- Cadence: daily
- AOI: Global Airports/Airfields
- Output: Vector, Geojson
- Delivery: Analytics API





VESSEL DETECTION

Object Detection model

Vessel detection on PlanetScope Monitoring

- Input imagery: PlanetScope scenes
- Cadence: near daily
- AOI: Global Ports
 - < ~15 km offshore
- Output: Vector, Geojson
- Delivery: Analytics API, Feed Viewer



+ Ship Detection Feed Viewer

www.planet.com/feeds

The screenshot displays the 'ANALYTIC FEEDS' interface for 'Ship Detection, Malaysia'. The left sidebar contains a list of detections with the following details:

Date and Time (UTC)	Count
2 April 2021, 03:40:29.7 UTC	15
2 April 2021, 03:10:57.5 UTC	6
30 March 2021, 03:10:53.9 UTC	16
28 March 2021, 03:32:02.9 UTC	11
28 March 2021, 03:32:00.6 UTC	8

The main map area shows a satellite view of the sea with several red and yellow bounding boxes highlighting detected ships. The interface includes a 'Confidence' slider set to 100% and a 'Show all time' toggle. A 'Review & export detects' button is located at the bottom of the sidebar.



+ Ship Detection Feed Viewer

www.planet.com/feeds

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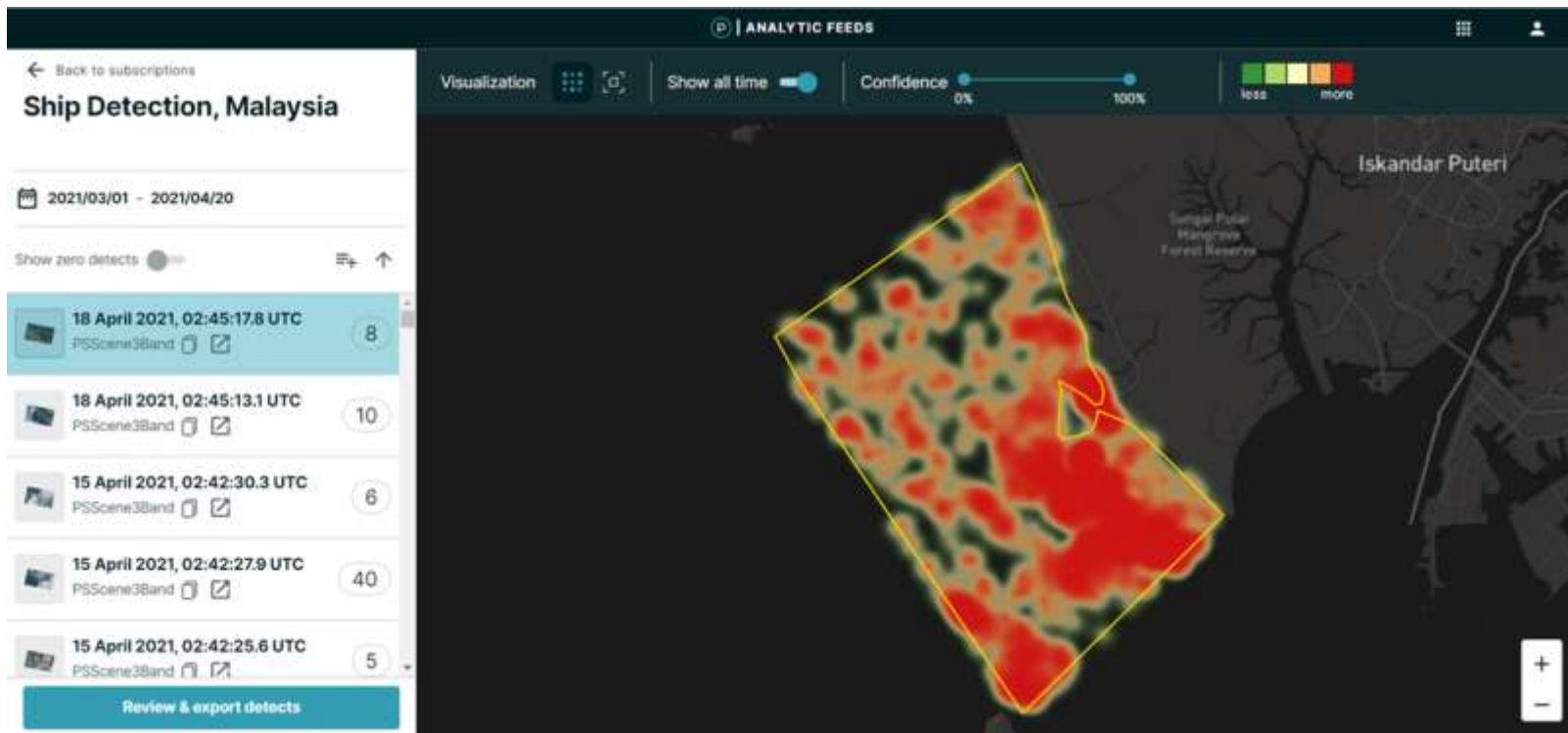
Date and Time (UTC)	Count
18 April 2021, 02:45:17.8 UTC	8
18 April 2021, 02:45:13.1 UTC	10
15 April 2021, 02:42:30.3 UTC	6
15 April 2021, 02:42:27.9 UTC	40
15 April 2021, 02:42:25.6 UTC	5

The main map area shows a satellite view of the region around Iskandar Puteri and the Sungai Pulai Mangrove Forest Reserve. A yellow polygon highlights a specific area where numerous red and pink dots represent detected ships. The interface includes a 'Confidence' slider set to 100% and a 'Show all time' toggle.



+ Ship Detection Feed Viewer

www.planet.com/feeds





CHINESE NAVAL FLEET EXERCISES • South China Sea • 26 March 2018



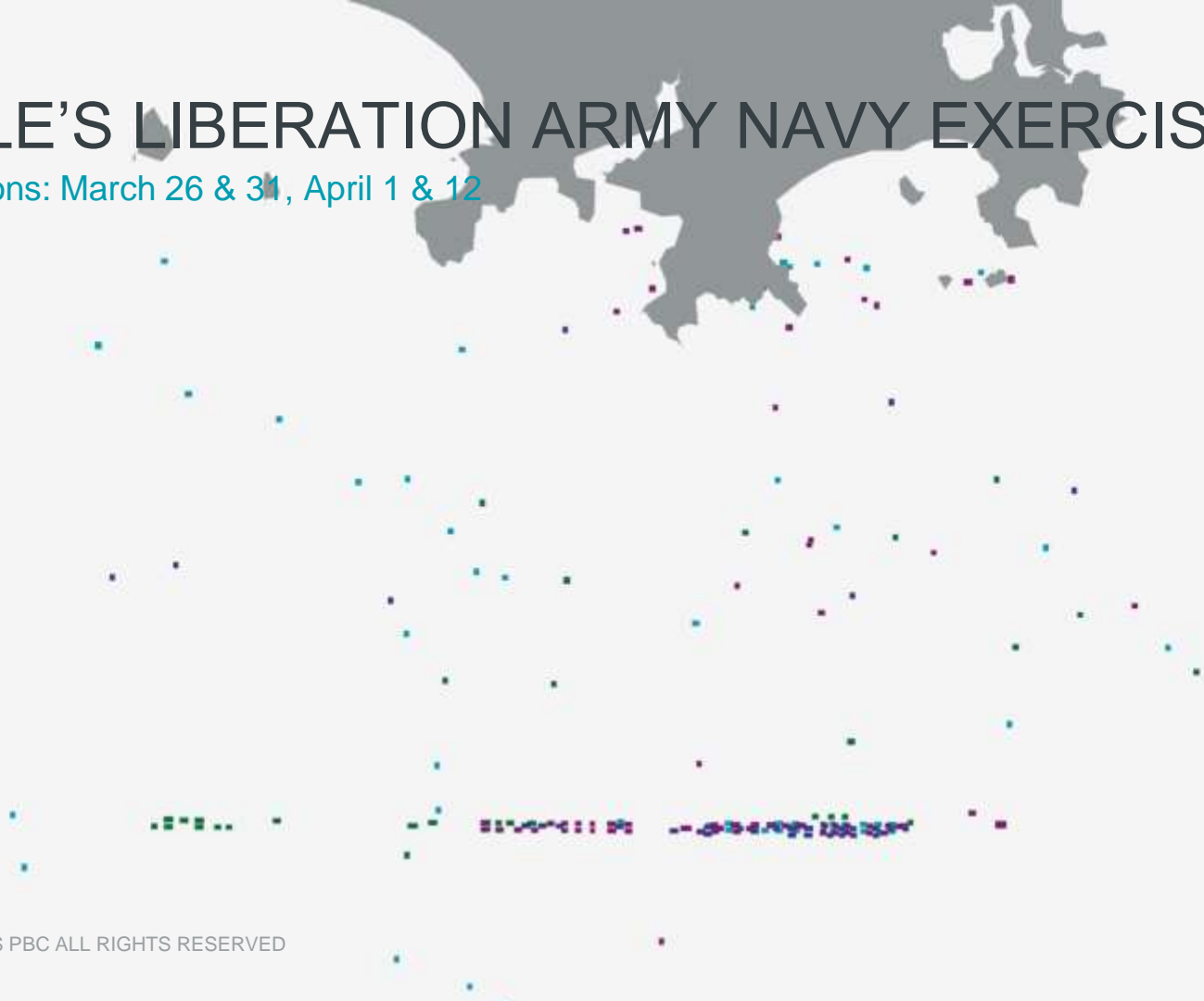


PEOPLE'S LIBERATION ARMY NAVY EXERCISES

Ship Detections: March 26 & 31, April 1 & 12

Ship Detections

- March 26
- March 31
- April 1
- April 12





From space systems to modern APIs & everything in-between

DELIVERY



Web Applications



APIs



Streaming & Cloud Storage



Subscriptions



Integrations

INSIGHTS



Raster Operations



Object Detection



Land Cover Classification



Change Detection



Summary Statistics

IMAGERY



Visual



Analysis-Ready



Basemaps



Stereo



Video



Fusion Monitoring

SPACE SYSTEMS



Design



Manufacturing



Missions



Groundstations



Dove



SkySat



+ Planet's broad suite of solutions

CAPTURE

Monitoring

PlanetScope
3.7 m imagery updated
on a near-daily basis



Tasking

SkySat imagery tasking
with the highest
intraday revisit capability
commercially available



ENHANCE

Basemaps

Visually consistent
and scientifically
accurate imagery over
broad areas



Archive

Access to proprietary
datasets back to 2009
and public datasets
back to 1972



ANALYZE

Analytic Feeds

Detection and analytic capabilities
layered on top of Planet
Monitoring and Basemaps



Thank You.

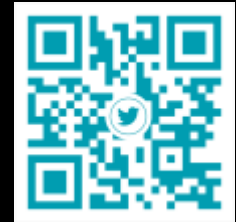
For more information, you may find us here:



 planet.com



 @planet



 @planet



Partha Pratim Ghosh
PreSales Director, APAC