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

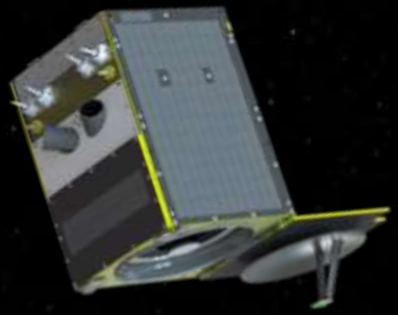
1. Planet Overview
2. Planet in Defense & Intelligence Value Chain
3. Defense & Intelligence Use Cases
4. Planet Analytics Feed
5. Q & A

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



21
SkySat Satellites

Doves

SATELLITES	GSD	CAPACITY
~200	**3.7 m**	**300 million km²**/day

ORBIT ALTITUDE	8 SPECTRAL BANDS
475 km	**Coastal Blue, Blue, Green I, Green II Yellow, Red, Red Edge, Near Infrared**

SkySat

SATELLITES	GSD	CAPACITY
21	**0.5 m**	**4,000** targets/day

ORBIT ALTITUDE	SPECTRAL BANDS
450 km	**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

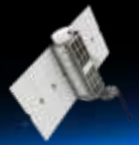
Daily collection assurance globally without the need for tasking

Automatic Change Detection

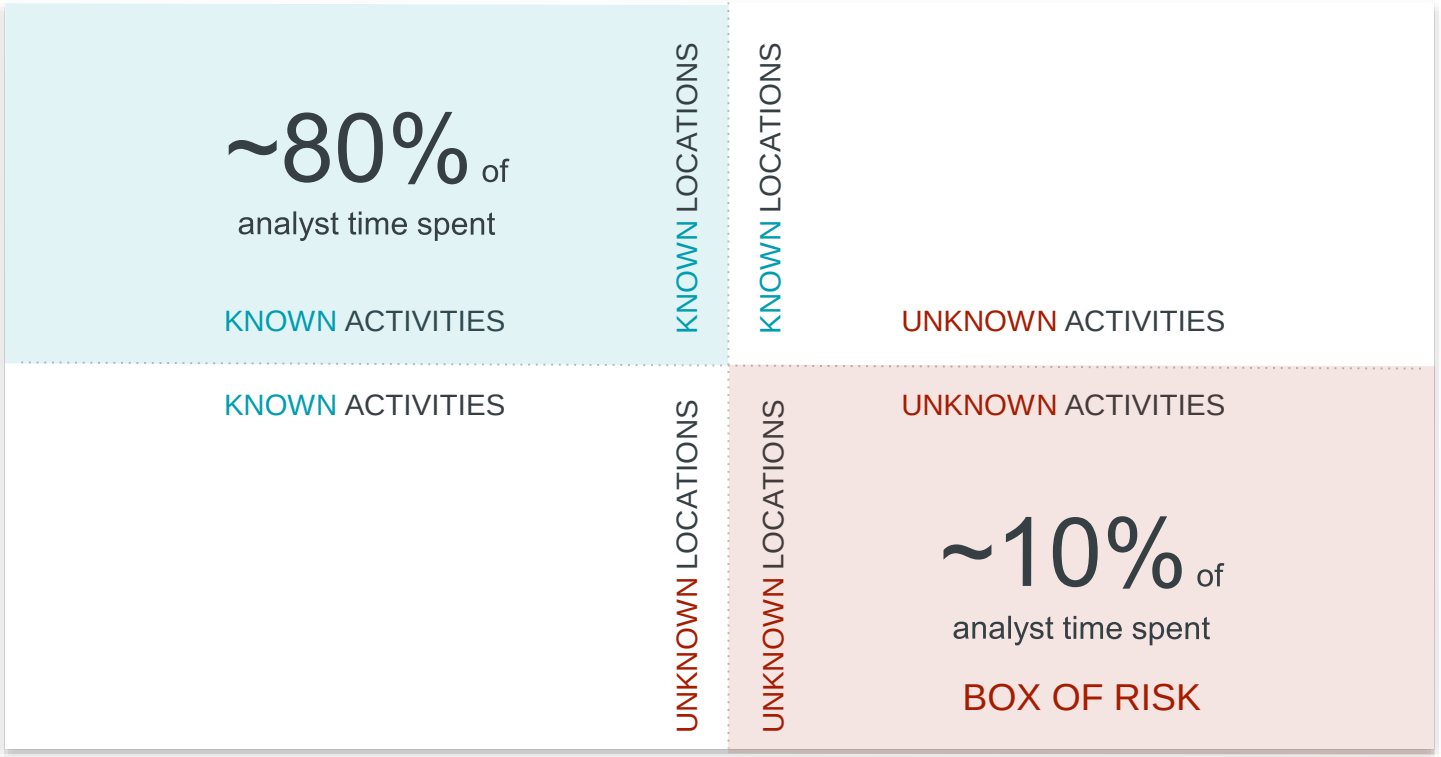
Decrease manual labor, save time to get to insights

Tip & Cue

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



GEOINT in practice



Statistics are approximations only

UPERNAVIK GLACIER • Avannaata, Greenland • July 25, 2021

Planet Data Reveals Critical Geopolitical Developments

"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."

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 roads 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

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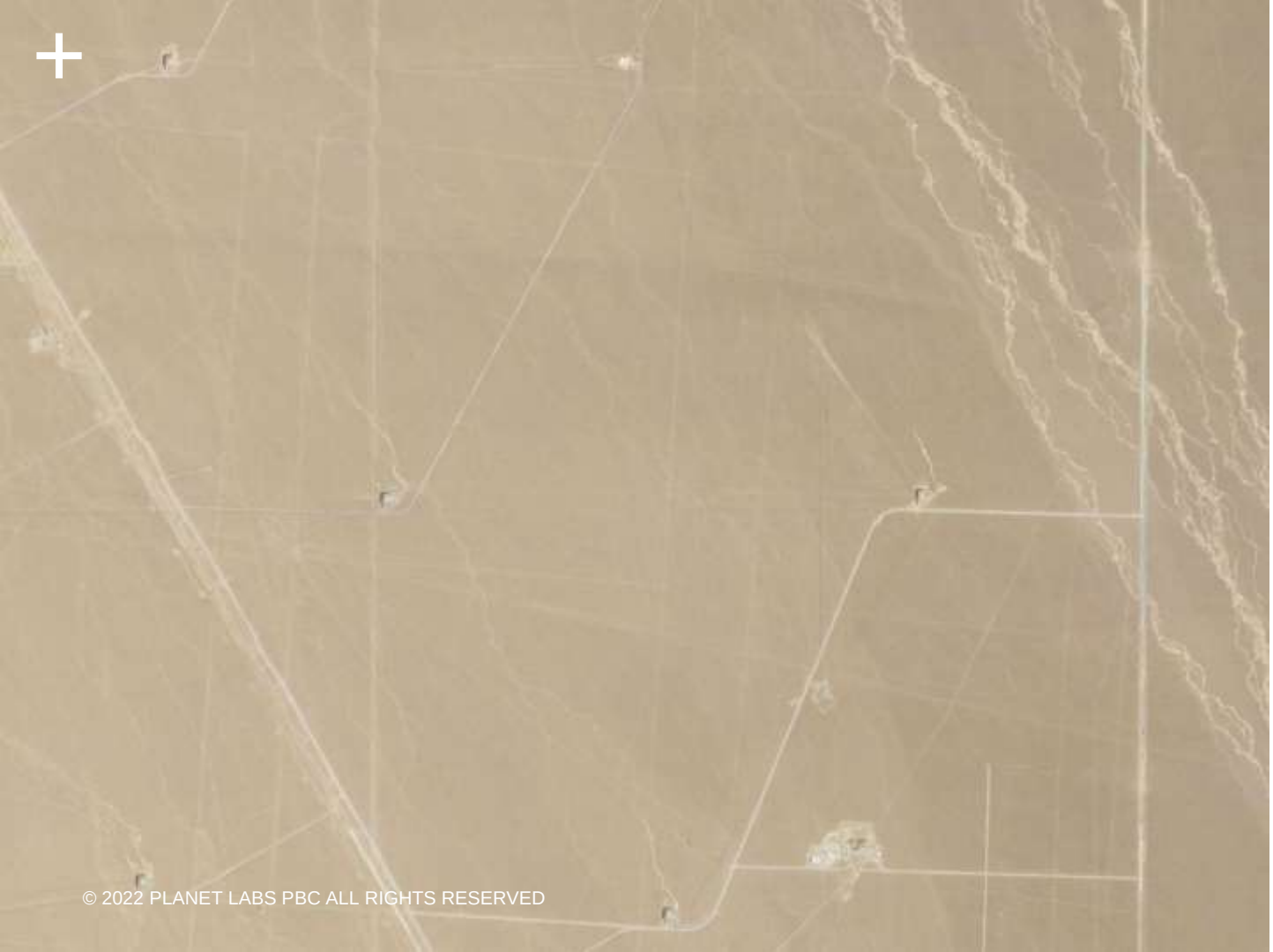

MISSILE SILO CONSTRUCTION

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

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15 August 2021

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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

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

AMU DARYA • Uzbekistan/Kazakhstan • September 6, 2020

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

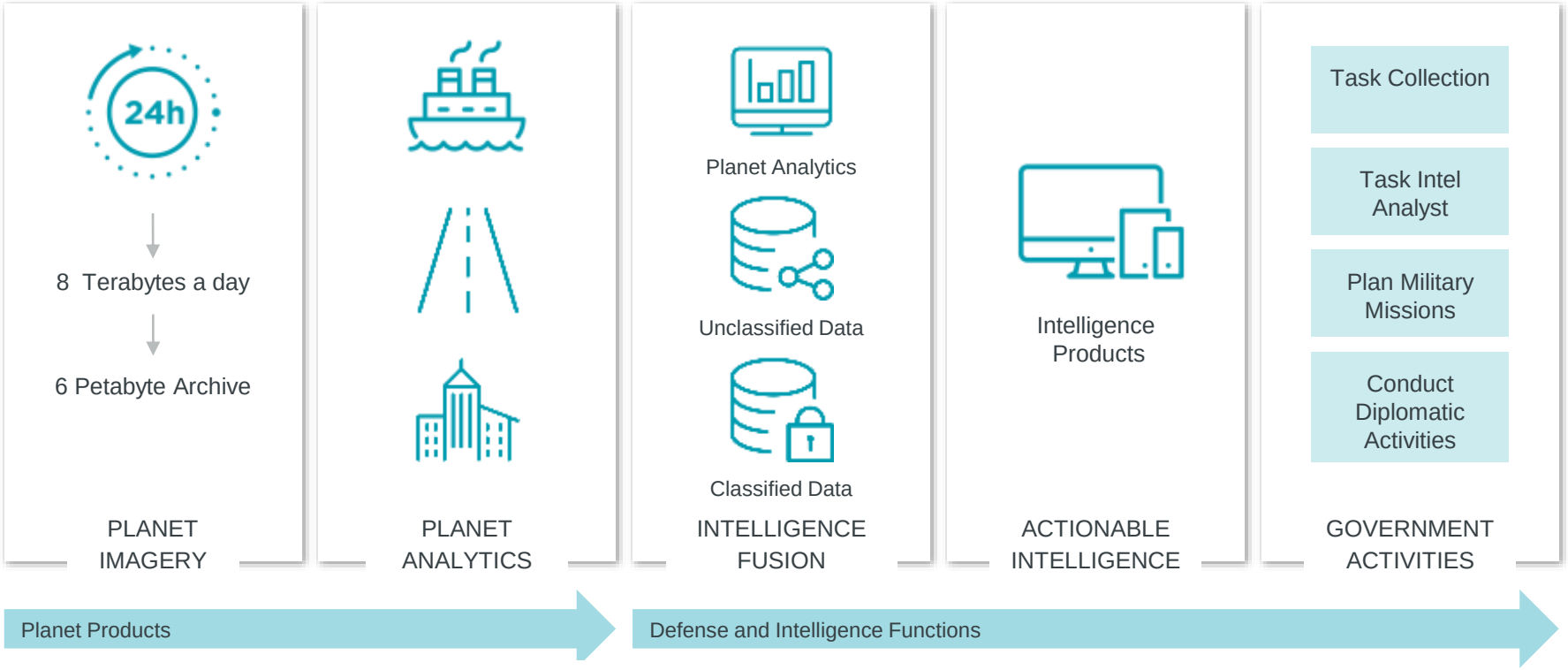
minutes or less

Greater precision

30

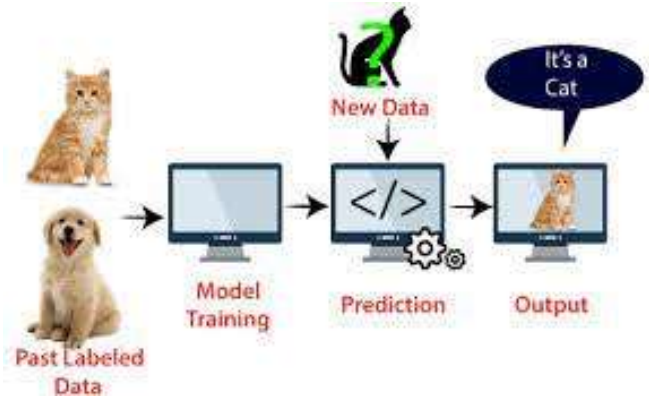
cm resolution

Defense & Intelligence Value Chain

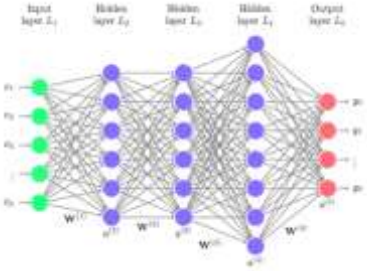


Analytics, AI, ML in Remote Sensing

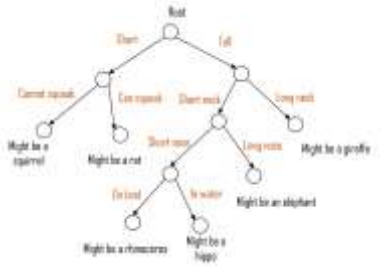
Object detection and classification



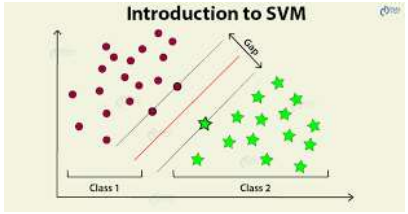
- Algorithms are decades old in all Standard COTS
- Challenges:
  - Training imagery/ Label
  - Processing power of hardware



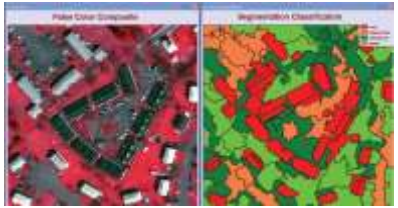
Deep Learning



Decision Tree



Support Vector Machine

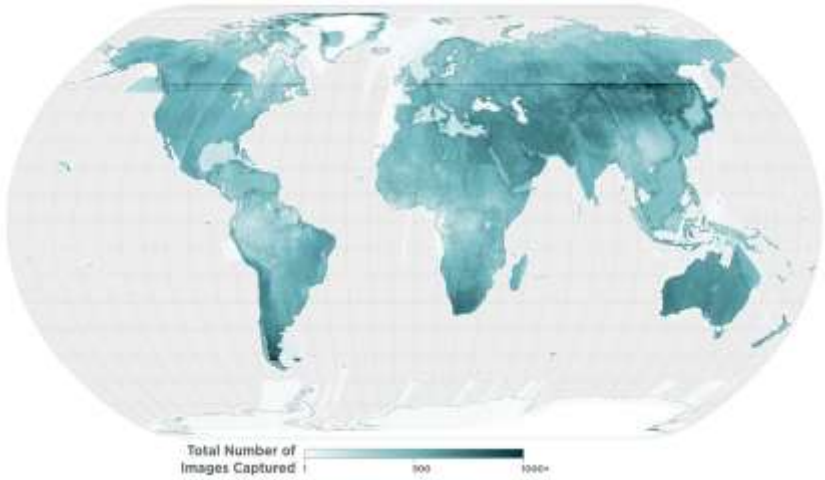


Object based classification

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

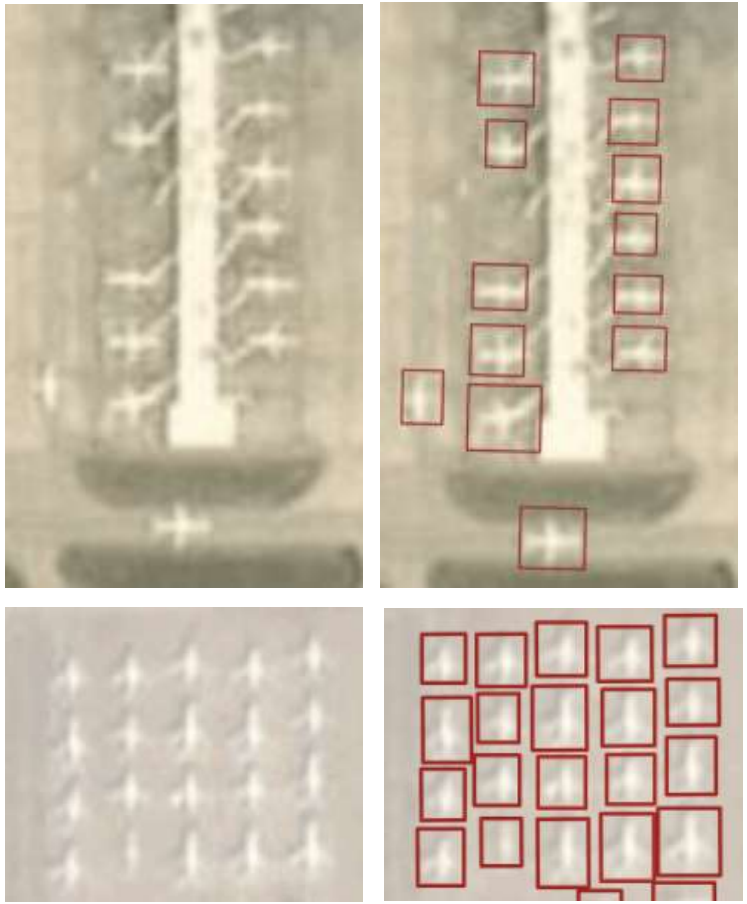
Allow people to get the Analytic outputs

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

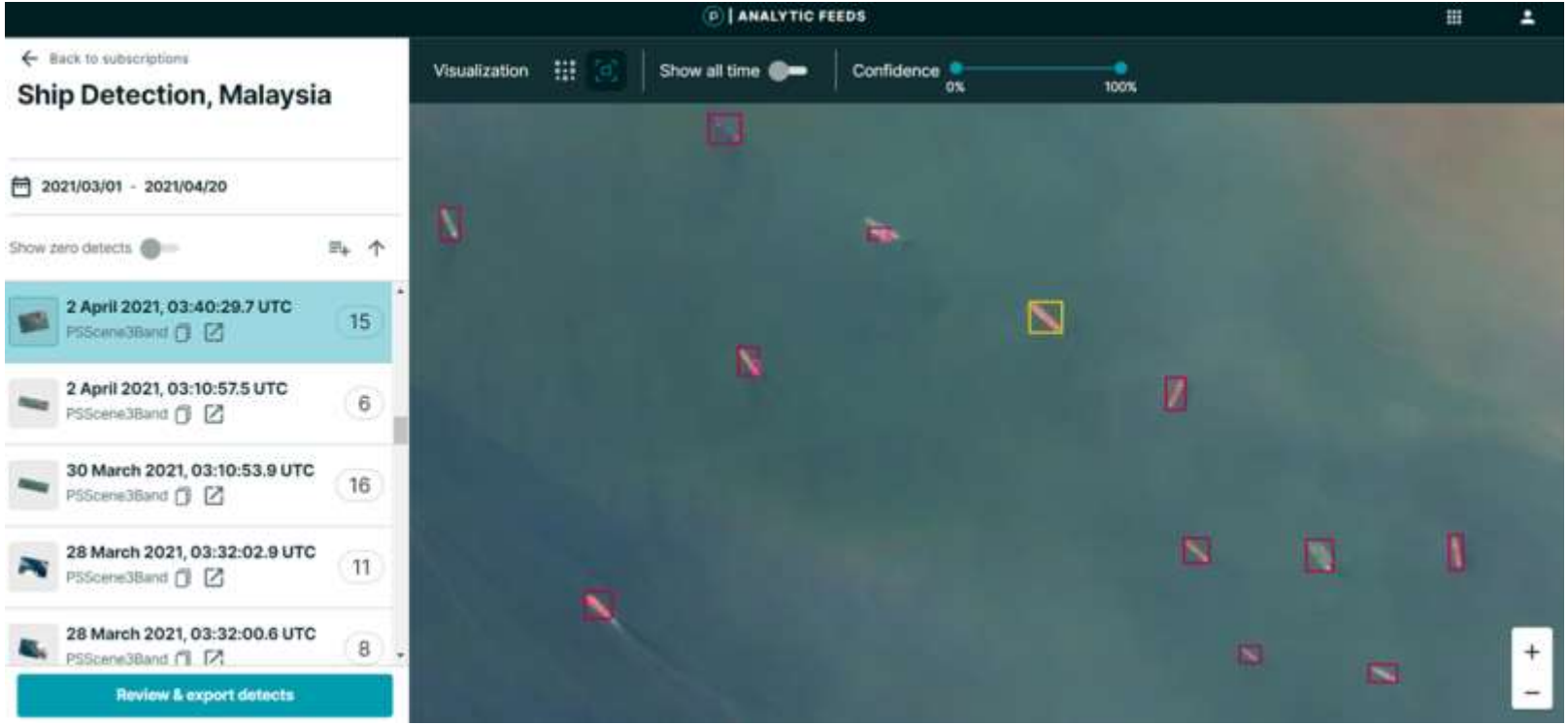
Object Detection model

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



Ship Detection Feed Viewer

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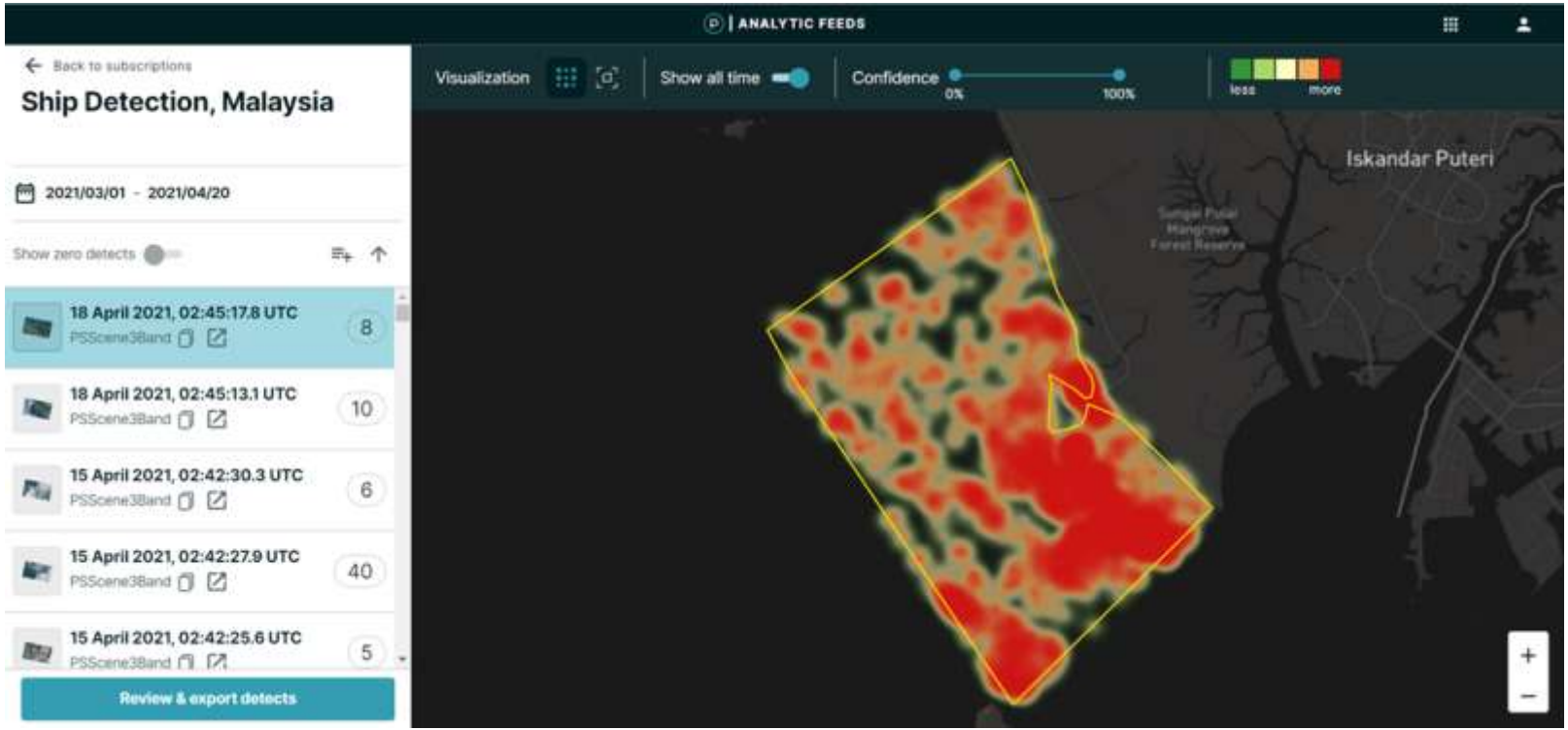
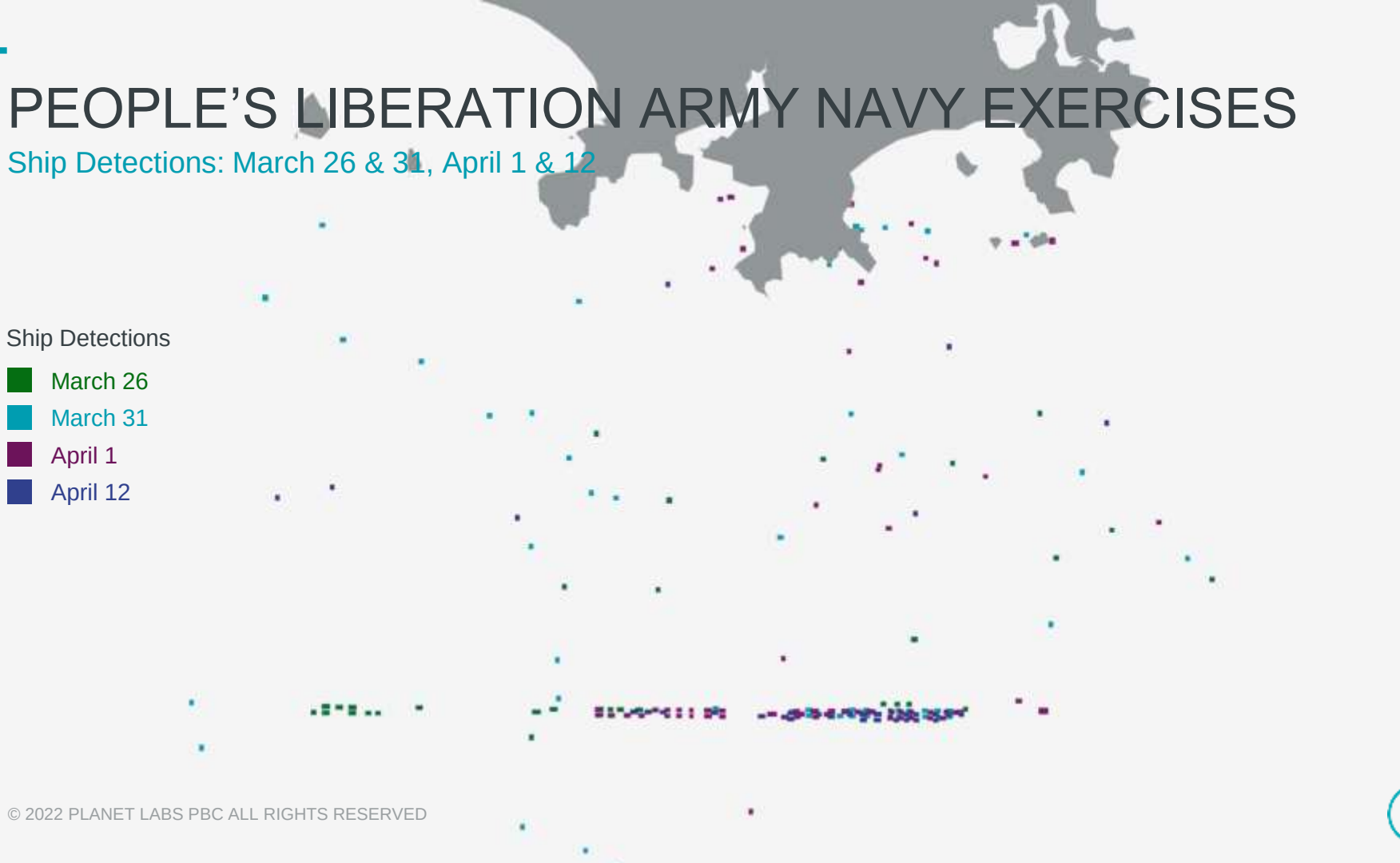


CHINESE NAVAL FLEET EXERCISES • South China Sea• 26 March 2018

PEOPLE'S LIBERATION ARMY NAVY EXERCISES

Ship Detections: March 26 & 31, April 1 & 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

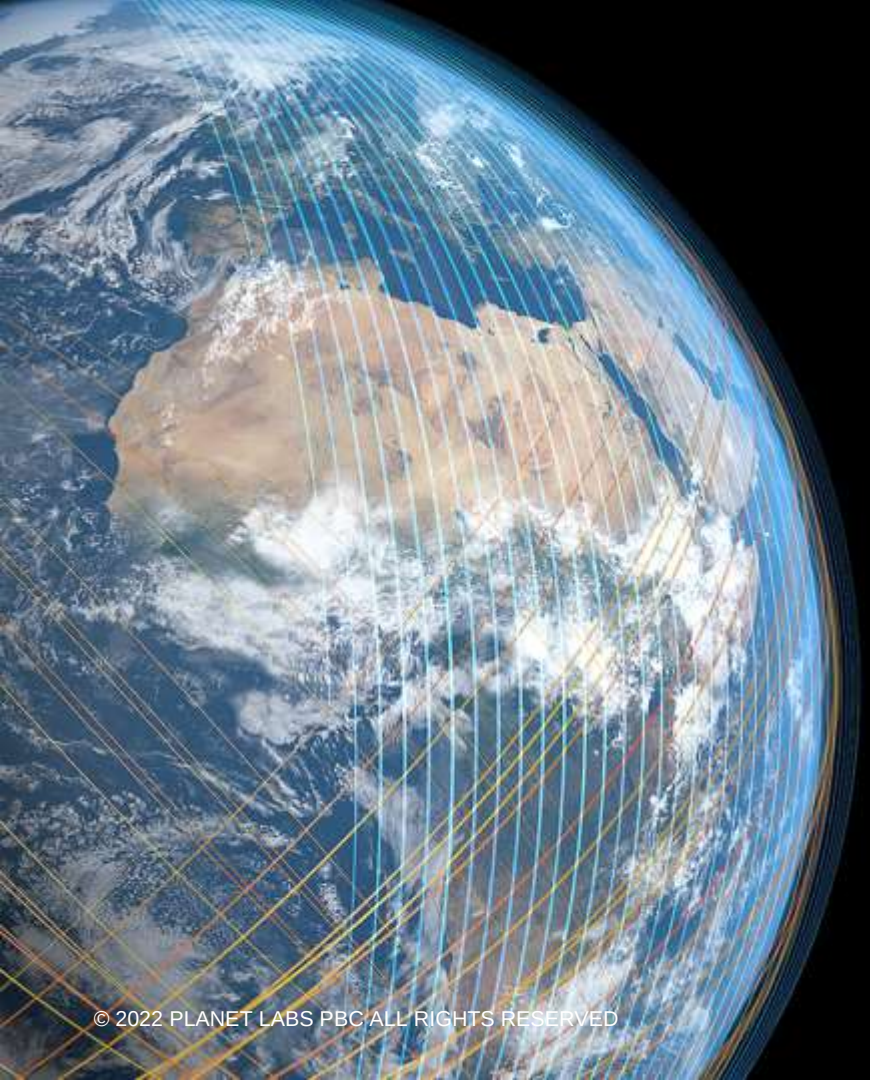
Archive

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

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Partha Pratim Ghosh
PreSales Director, APAC