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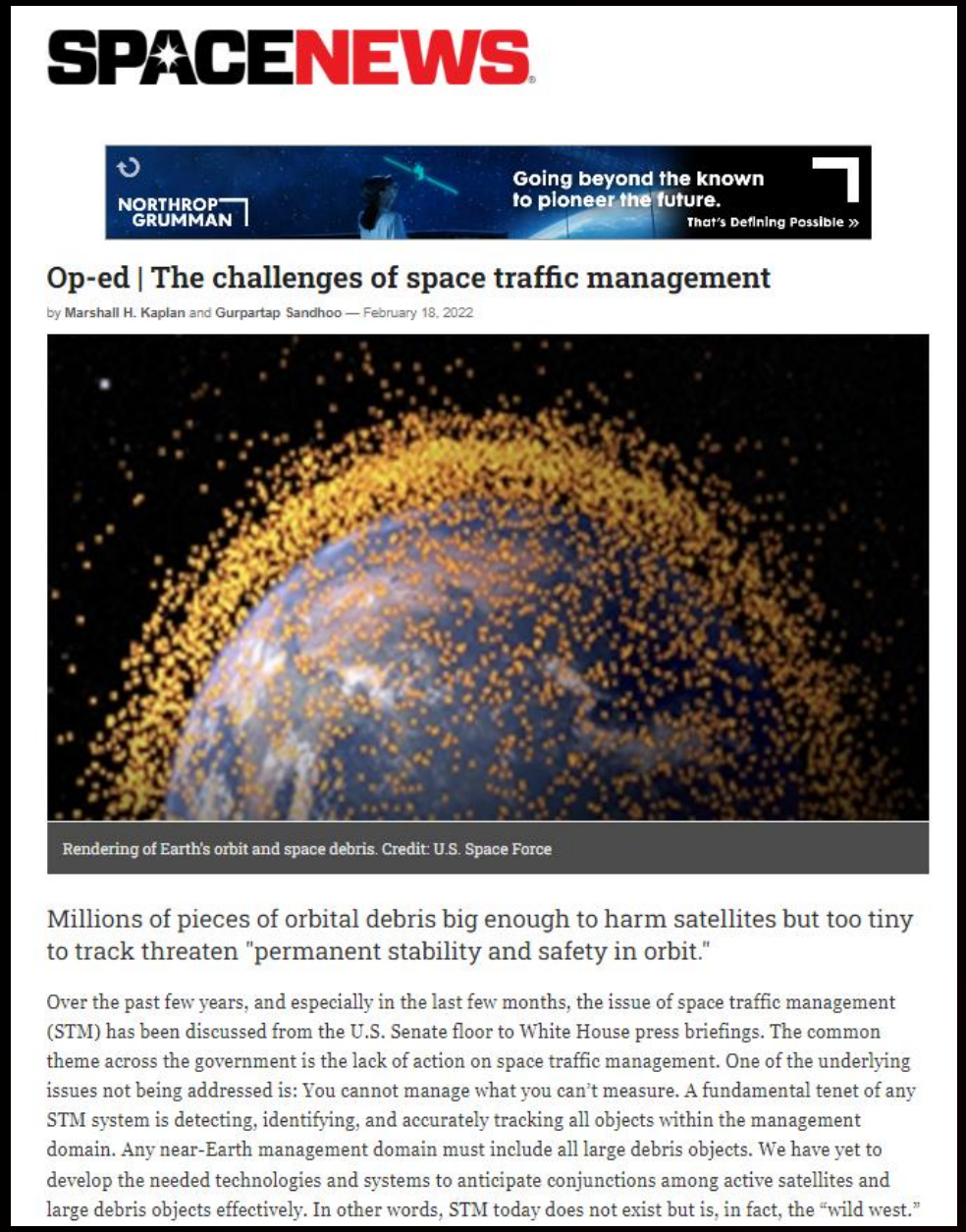
Land, sea, and space domain awareness through the cloud

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SPACENEWS

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That's Defining Possible »

Op-ed | The challenges of space traffic management

by Marshall H. Kaplan and Gurpartap Sandhoo — February 18, 2022

Rendering of Earth's orbit and space debris. Credit: U.S. Space Force

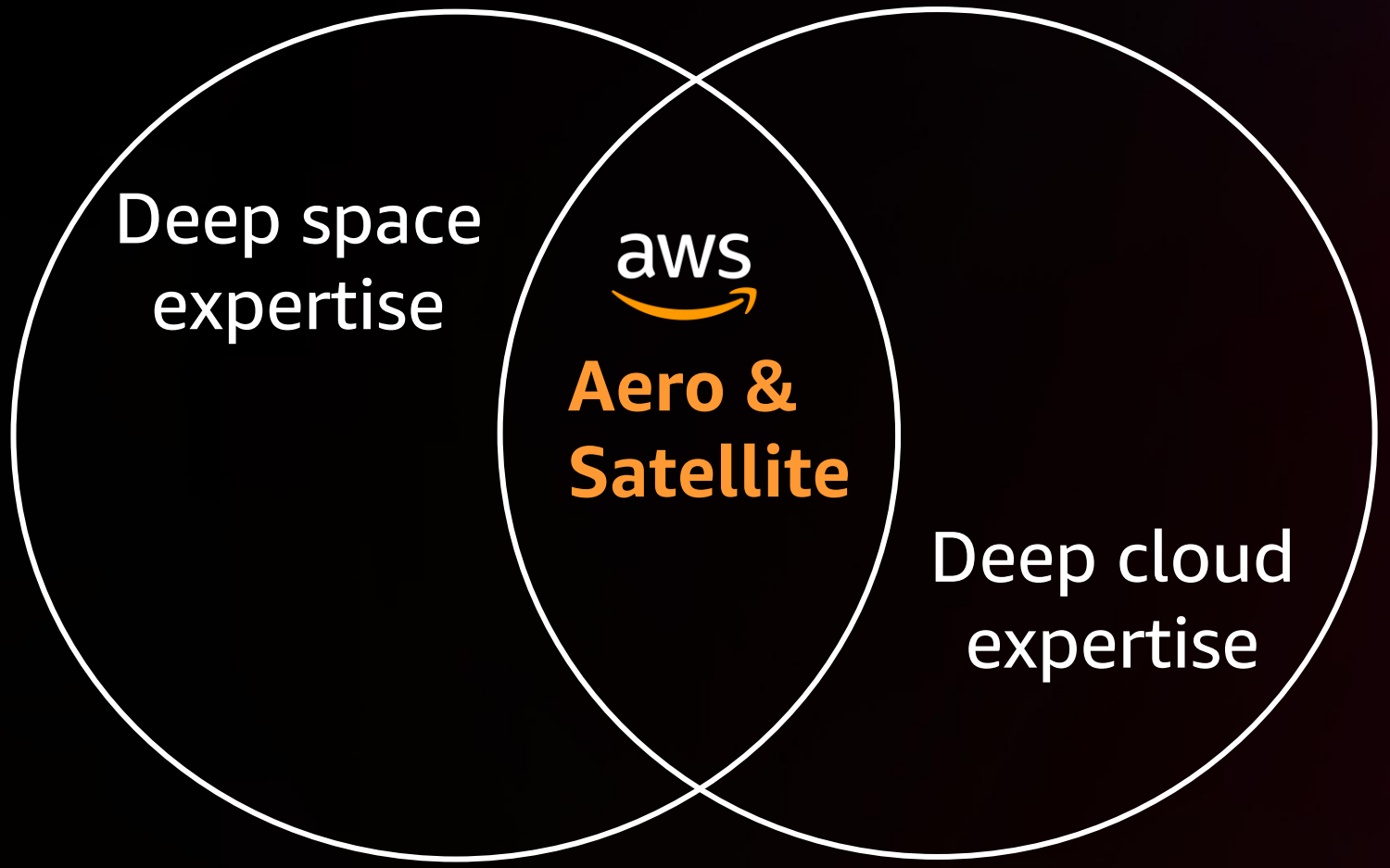
Millions of pieces of orbital debris big enough to harm satellites but too tiny to track threaten "permanent stability and safety in orbit."

Over the past few years, and especially in the last few months, the issue of space traffic management (STM) has been discussed from the U.S. Senate floor to White House press briefings. The common theme across the government is the lack of action on space traffic management. One of the underlying issues not being addressed is: You cannot manage what you can't measure. A fundamental tenet of any STM system is detecting, identifying, and accurately tracking all objects within the management domain. Any near-Earth management domain must include all large debris objects. We have yet to develop the needed technologies and systems to anticipate conjunctions among active satellites and large debris objects effectively. In other words, STM today does not exist but is, in fact, the "wild west."

Commercial and government entities struggle to get a full transparent view of the space environment and potential risks

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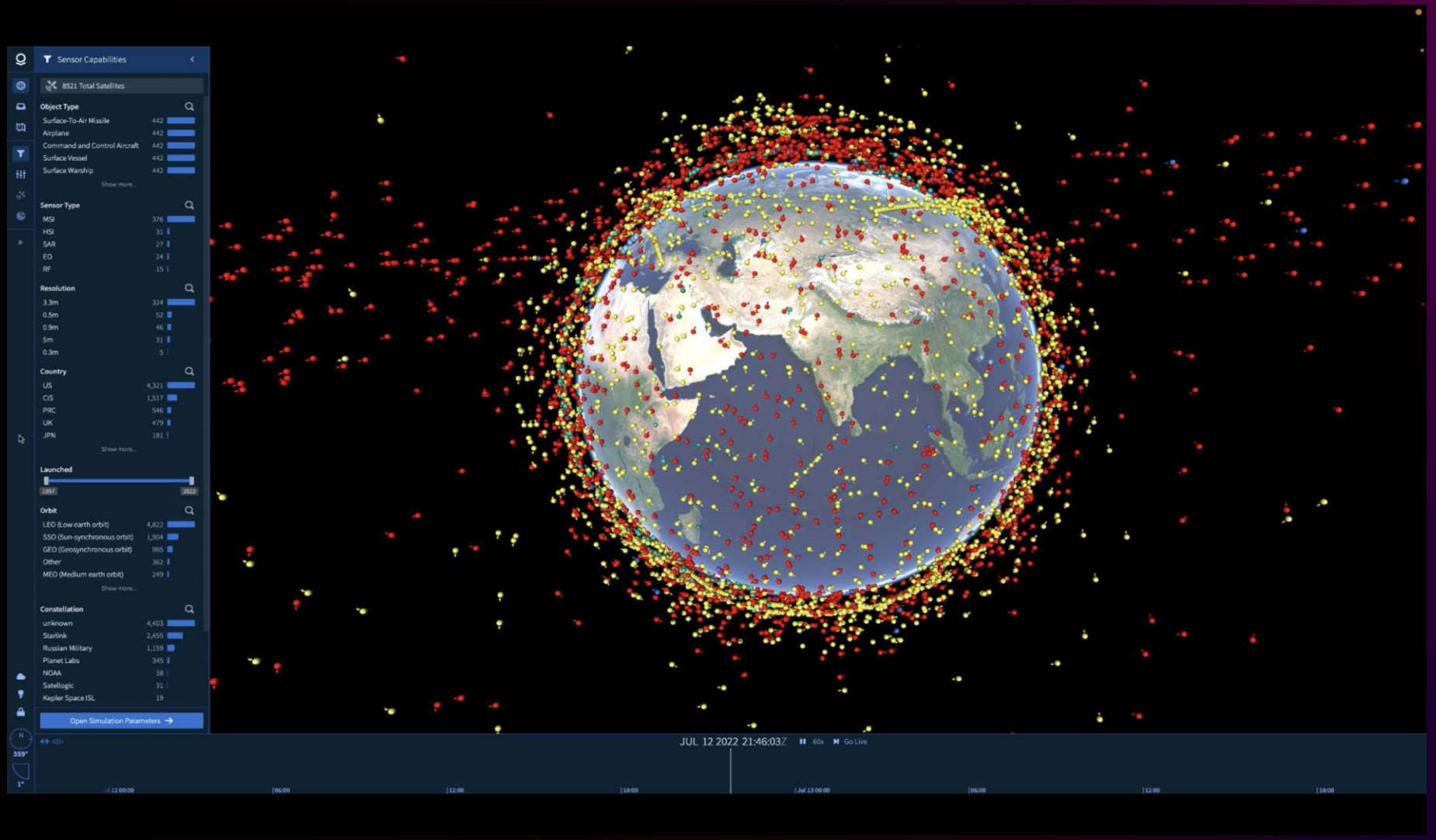
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Introducing ARGUS



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Introducing our presenters

Dr. Peter Wegner
Chief Technology Officer

BLACKSKY

Nicole Robinson
President

URSA SPACE

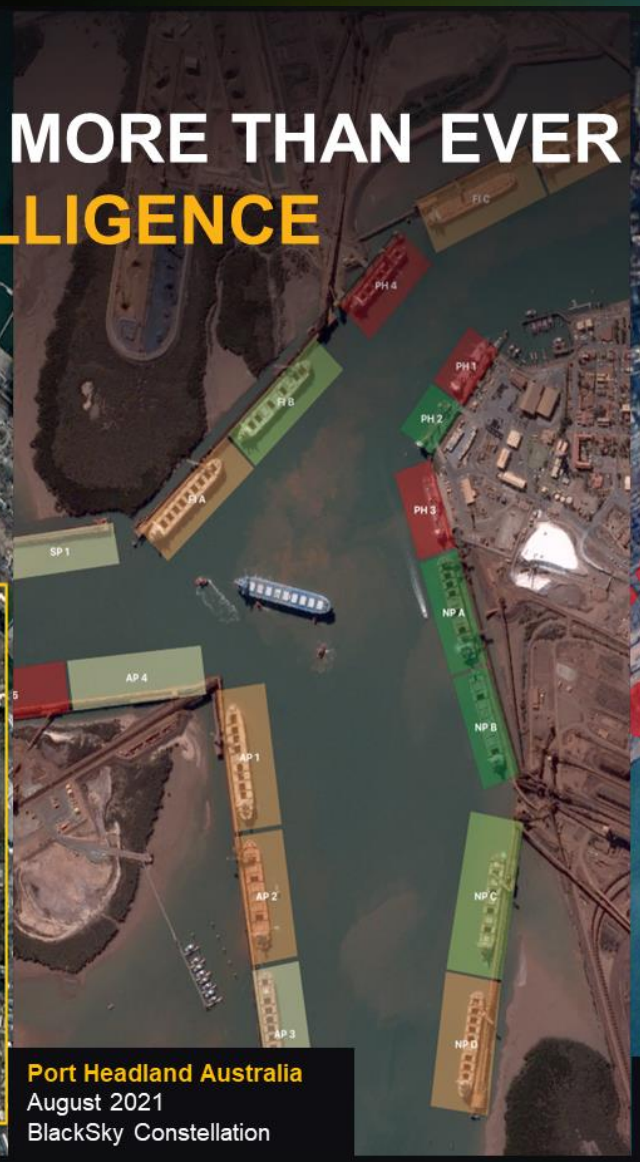
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OUR WORLD NOW MORE THAN EVER NEEDS REAL-TIME GEOSPATIAL INTELLIGENCE



Mariupol Ukraine
March 10, 2022
BlackSky Constellation



Port Headland Australia
August 2021
BlackSky Constellation



Beirut Port Explosion
August 2020
BlackSky Constellation



Edwardsville, Illinois
December 2021
BlackSky Constellation

National and Homeland Security

Crisis Management and Response

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Rivne Nuclear Power Plant
2022-03-14 14:28 UTC

Zaporizhzhia NPP
2022-03-09 14:18:50 UTC

South Ukraine NPP
2022-03-15 07:11:23 UTC

Khmelnitsky NPP
2022-03-14 08:00:13 UTC

Chernobyl NPP
2022-03-14 14:28:48 UTC

Reportedly Russian Occupied (Mar 4)

Reportedly Russian Occupied (Feb 24)

Fears mount over Russian seizures of Ukraine's nuclear power plants



Russian attack on Ukraine's Zaporizhzhia nuclear power plant stirs fury, fear



Near Voznesensk, a battle broke out with the invaders, near the South Ukrainian nuclear power plant



The armed forces repulsed the air attack of the Russian Federation in Starokonstantinov



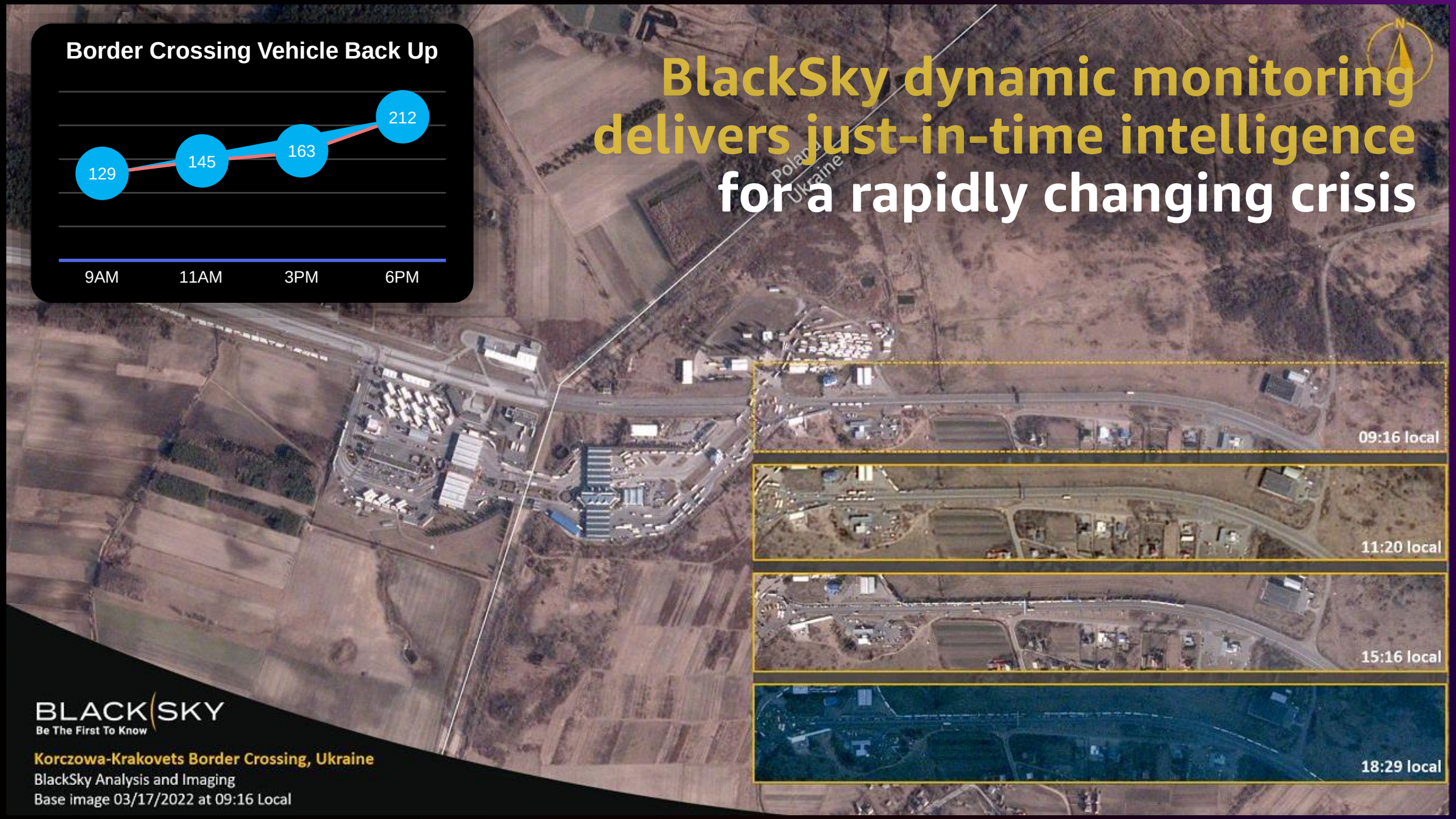
Officials say Ukraine no longer in control of Chernobyl nuclear site



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Ukrainian Nuclear Power Plant Monitoring

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BlackSky analytic capabilities



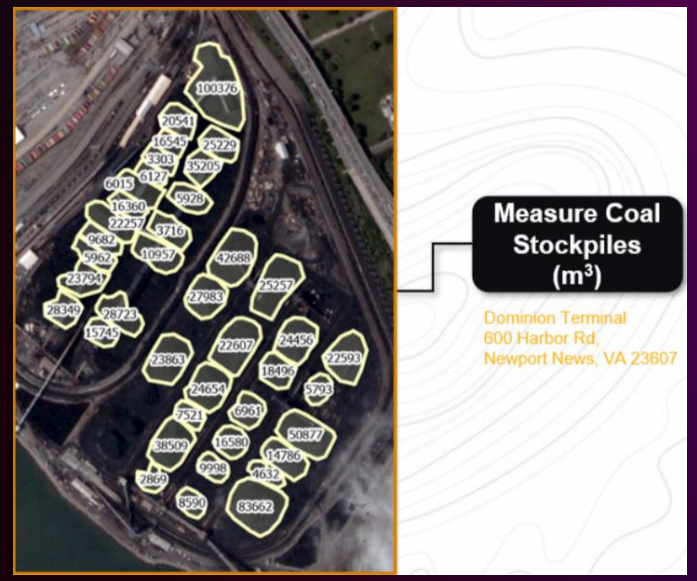
Detection

- Rapid mapping unmapped regions
- Rapidly assessing post catastrophe changes to structures



Motion detection

- Monitoring illicit vessels and aircraft
- Monitoring patterns of life and adding transparency to changes



3D analytics

- Volume analysis
- Stockpile analysis

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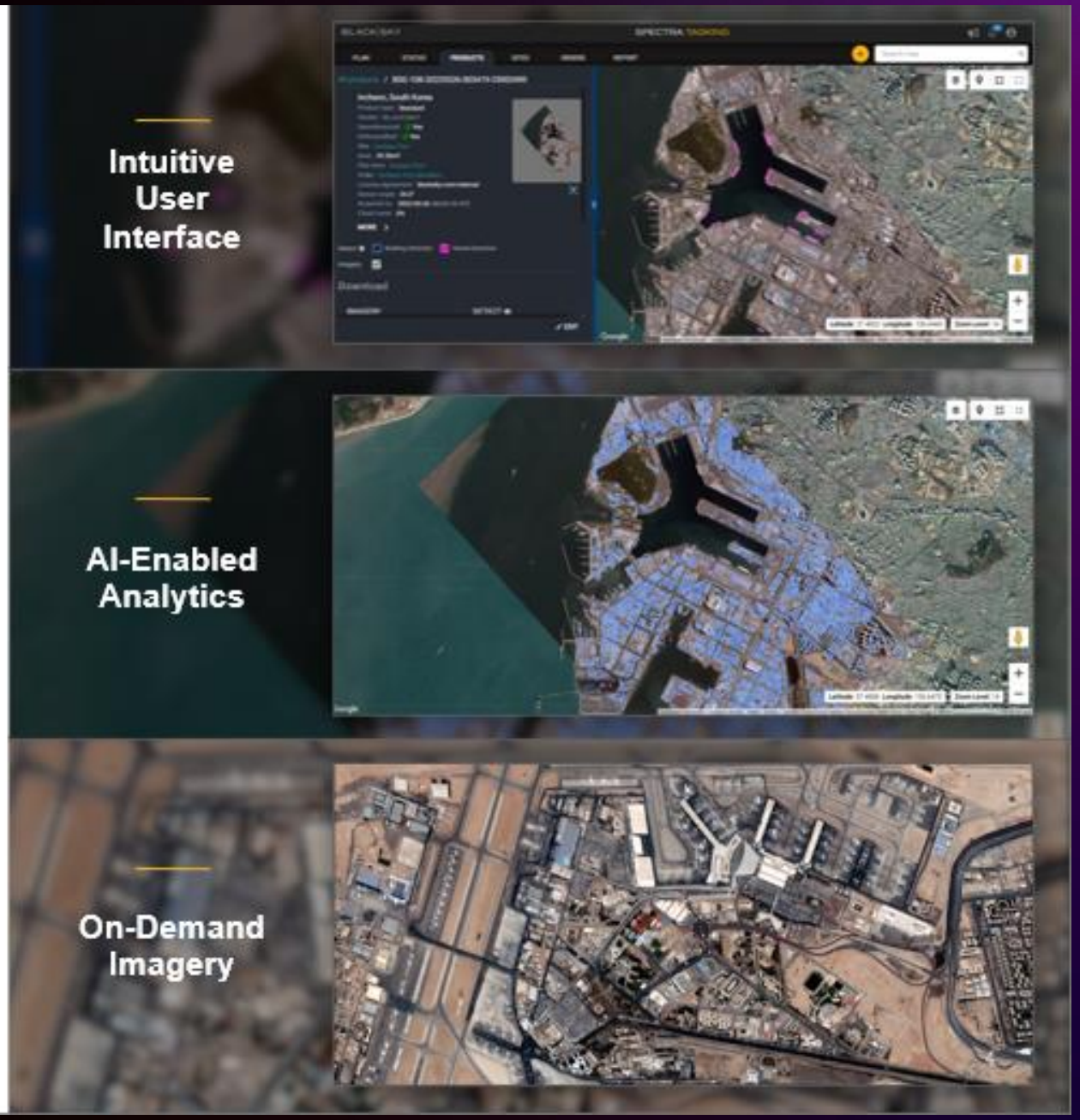
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BlackSky delivers a game changing customer experience

End-to-end real-time platform operating at scale

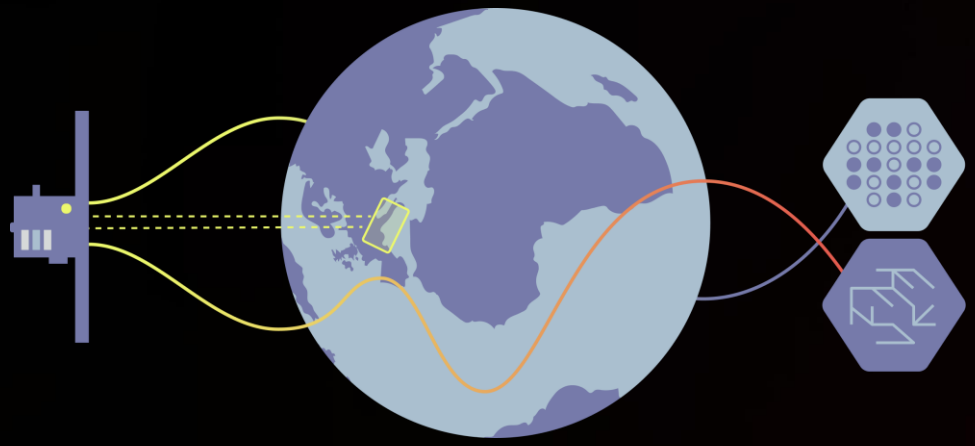
2,000+ images	Daily Delivery Rate
30 – 90 minutes	Delivery Timeline
15x daily/hourly	Revisit Rate
99.9%	Uptime & Availability

BLACK SKY



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Satellite Analytics as a Service



URSA SPACE

Regional monitoring subscription service

Resiliency in our virtual constellation

Assurance of collections from our trusted vendors

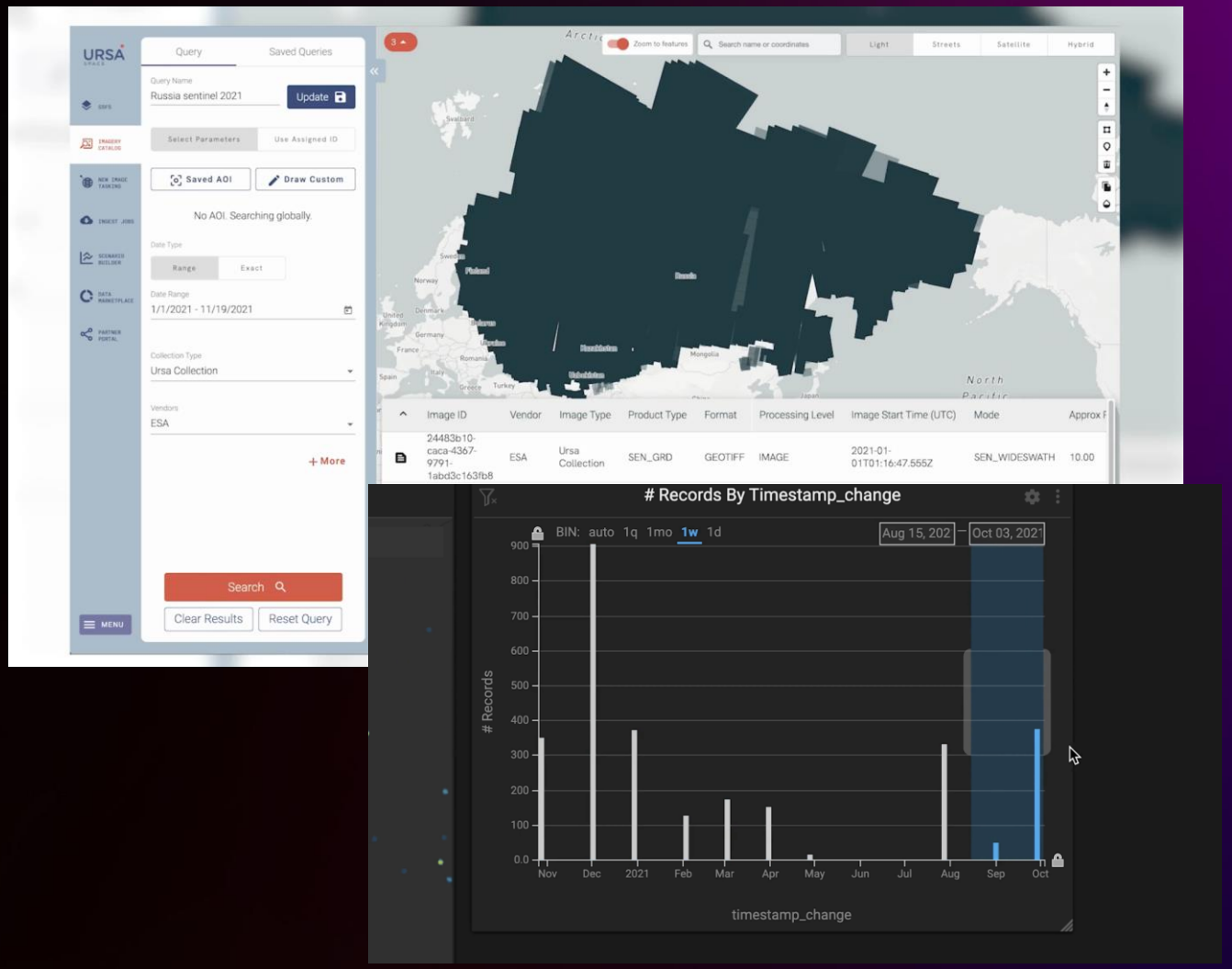
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Collection

Ursa downloaded and stored 87,000 low-res, 10 million SAR images on AWS Cloud (Jan-Nov 2021)

Change detection algorithms processed through Amazon EC2 instances on imagery in Aug-Oct 2021 range



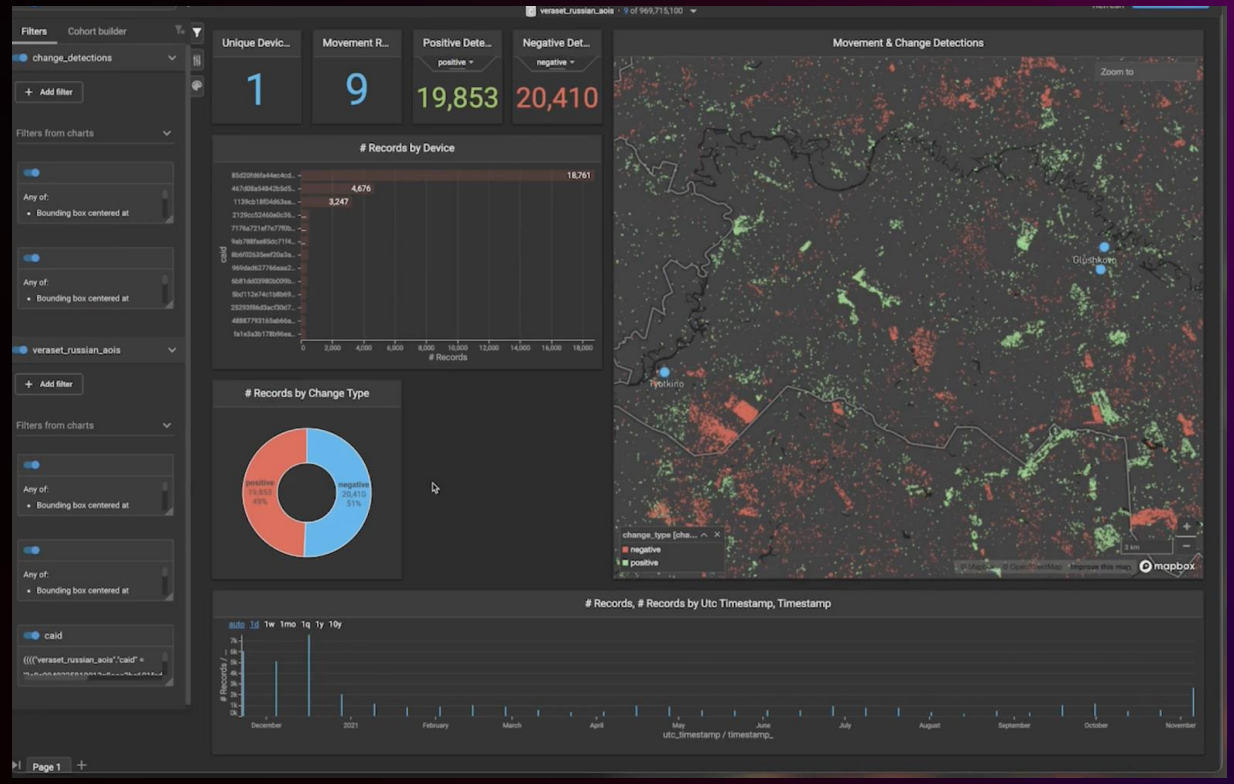
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Analysis

Data fusion: 1 billion mobile device interactions from 21 million devices across cosmodrome sites in Russia, indicating 2.5 million changes

Results in >24 hours

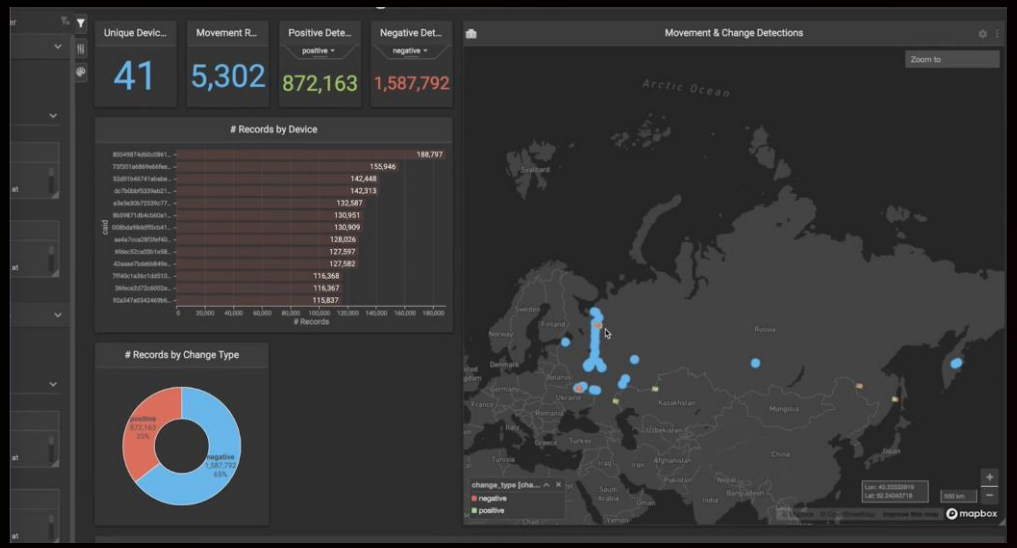
Speed to turnaround enabled by AWS Cloud storage and Amazon EC2 instances

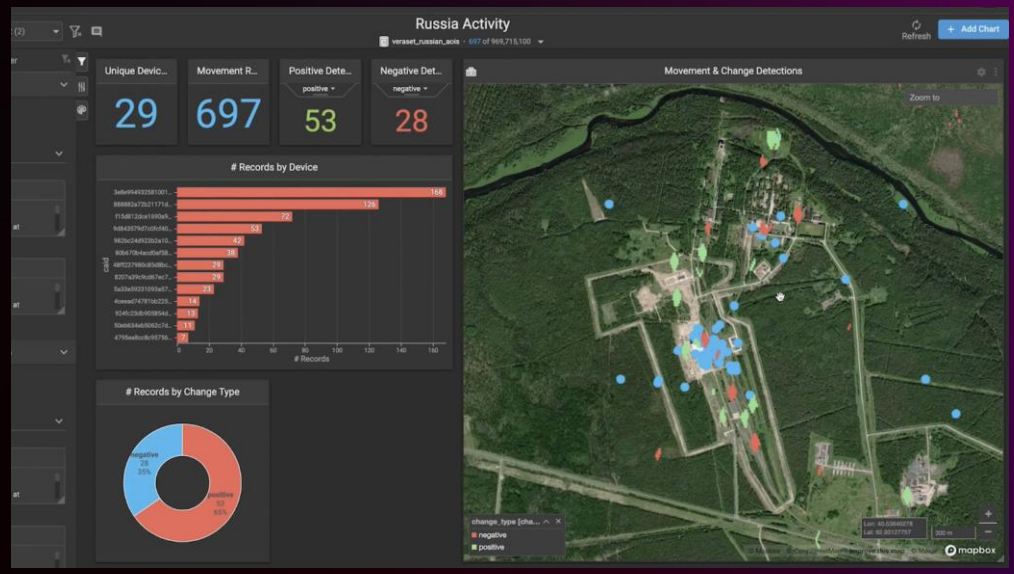


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Result

At Complex 41 in Plesetsk, green indicates new infrastructure built in the last few months





Tracking where these devices travel tells us potential sites for future missile launches, especially in the countryside

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