Satellite Vision: Revolutionizing Land Use Intelligence for India's Urban and Natural Systems
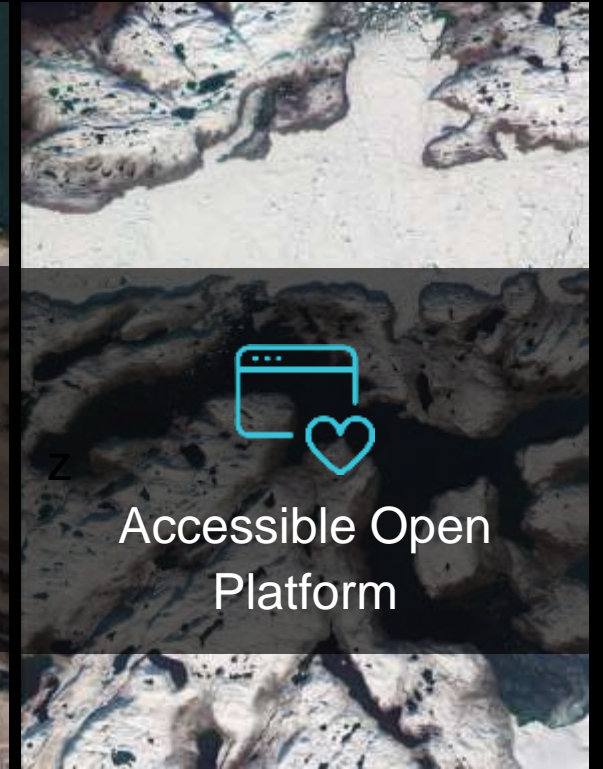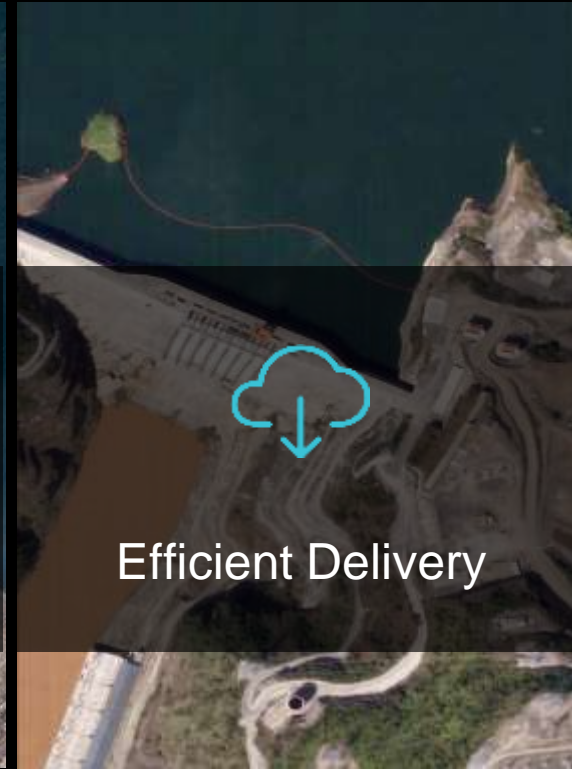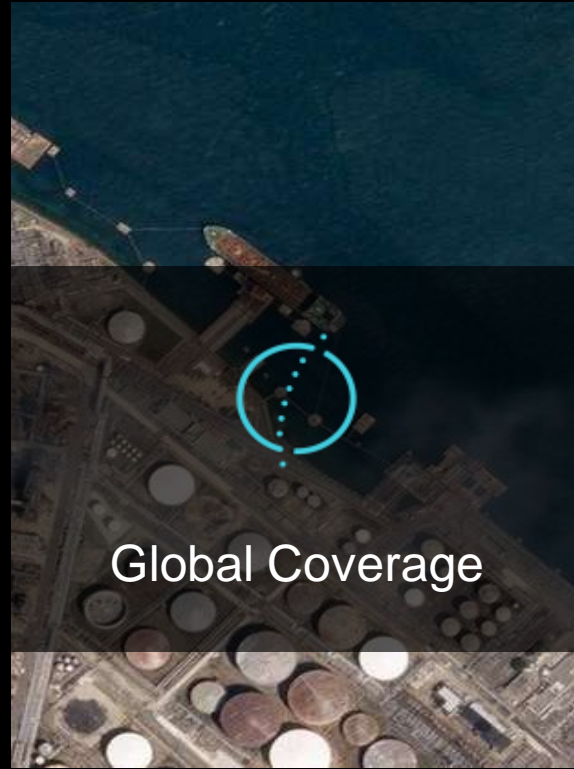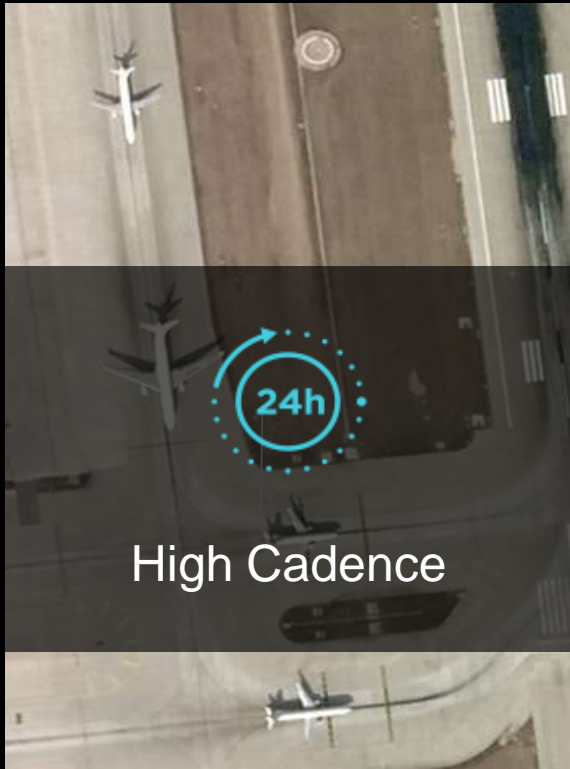
+

Partha Ghosh, Presales Head – India, Planet

STATUE OF EQUALITY • India • February 12, 2022

Industry Requirements from Space Technology

High Cadence

Global Coverage

Efficient Delivery

Accessible Open Platform

Sikkim Glacial Lake Outburst Flood (GLOF)

Before Image 29 September 2023
After Image 6 October 2023
PlanetScope 3m Visual

Sikkim

- Chungthang Dam
- Singtam Dam
- Bridges
- Human resources
- Properties
- Environment
- Forest
- Natural Resources
- Agriculture

planet.

SIKKIM GLOF: Chungthang Dam Washed Away

PlanetScope | 29 September 2023

PlanetScope | 9 October 2023

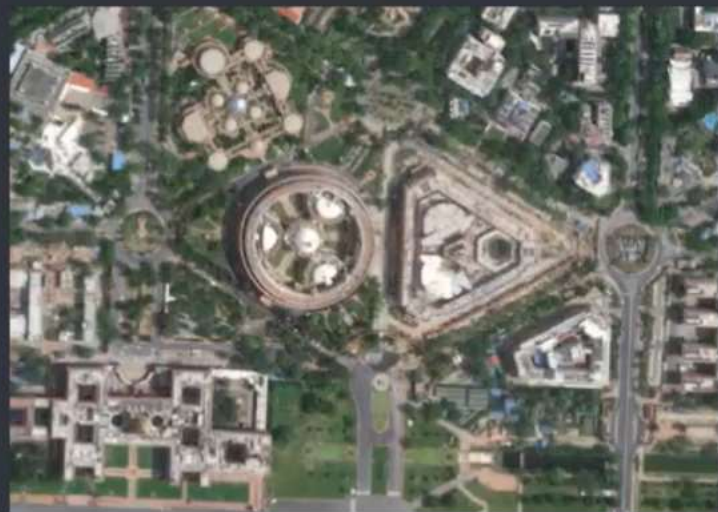**SINGTAM DAM**• Sikkim, India• PlanetScope (3m) • 29 September 2023

SINGTAM DAM• Sikkim, India• PlanetScope (3m) • 9 October 2023

SINGTAM DAM • Sikkim, India • SkySat (50cm) • 10 October 2023

straitstimes.com/multimedia/graphics/2023/08/india-infrastructure-big-plans/index.html

THE STRAITS TIMES

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Building India | India's big plans   Ports and waterways   'Smart' India   Digital master plan
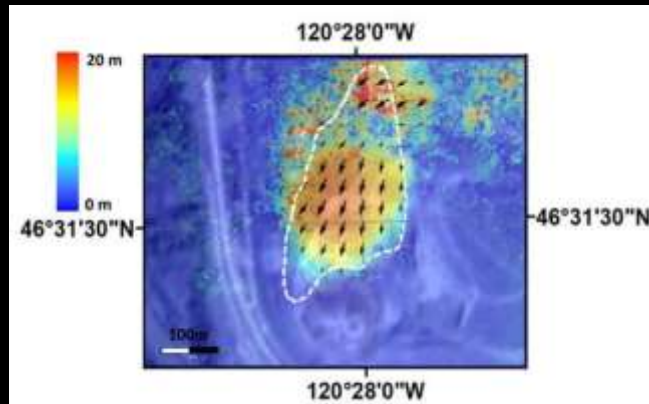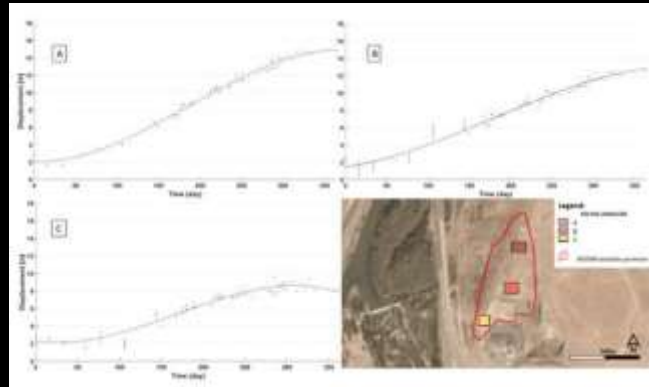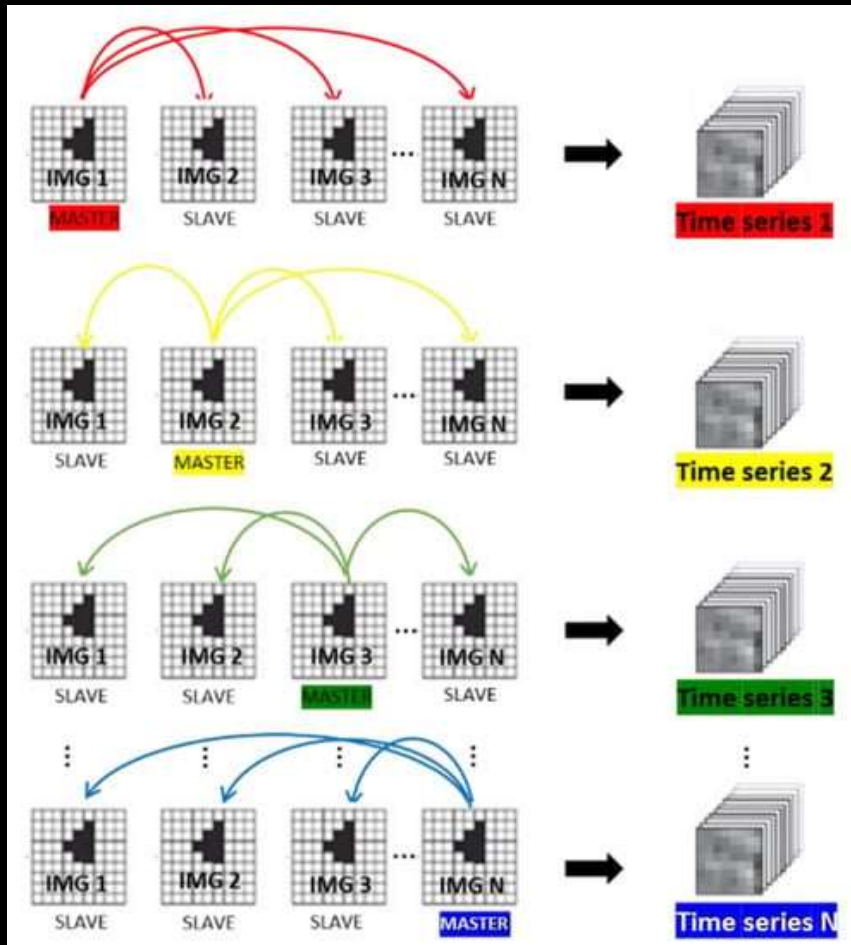

Building boom in India

Planet Imagery for Land Displacement Analysis for Landslide Monitoring

Progressive correlation scheme used to achieve the fully redundant stack of correlation maps. This process was iterated using all the 63 PlanetScope selected images as the master

Sliding Time Master Digital Image Correlation Analyses of CubeSat Images for landslide Monitoring: The Rattlesnake Hills Landslide (USA)

Why PlanetScope?
Deep stack of archive imagery
Near Daily coverage
Cloud Free coverage
High Spatial Resolution

High frequent PlanetScope imagery are very effective to analyse and map displacements. Rattlesnake Hills landslide kinematic behavior between September 2017 and September 2018, achieving a very good fitting with the displacement data collected by local authorities during field surveys.

Mazzanti, P.; Caporossi, P.; Muzi, R. Sliding Time Master Digital Image Correlation Analyses of CubeSat Images for landslide Monitoring: The Rattlesnake Hills Landslide (USA). Remote Sens. 2020, 12, 592. https://doi.org/10.3390/rs12040592

More Spectral Band Means More Analytical Capacities
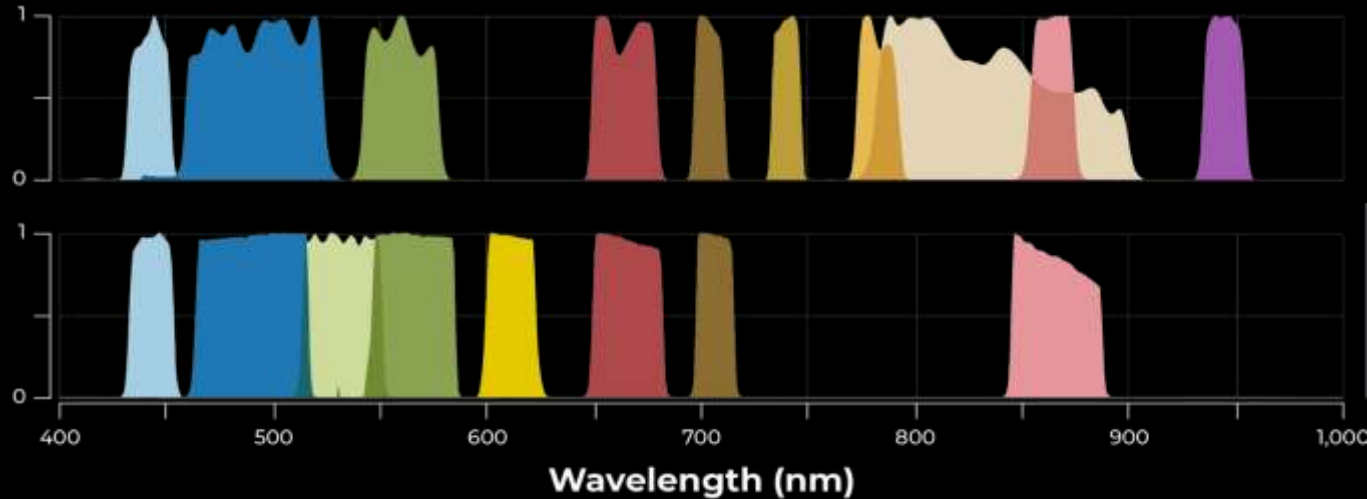
Sentinel – 2A

PlanetScope

SuperDove (PSB.SD)
Relative Spectral Response
Coastal Blue 431-452 nm

Blue: 465-515 nm

Green I: 513. - 549 nm

Green: 547. - 583 nm

Yellow: 600-620 nm

Red: 650 - 680 nm

Red-Edge: 697 - 713 nm

NIR: 845 - 885 nm

- Basic
- DN
- Radiance
- Surface Reflectance

- Orthorectified
- Atmospherically Corrected

Planet offer Atmospherically Corrected Analysis Ready Surface Reflectance Imagery

Planet offer Analysis Ready Data (ARD) Mosaic

Satellite Imagery → **Pre-Processing**
Radiometric Correction
Atmospheric Correction
Geometric Correction
Spatial Enhancement
→ **Mosaic** → **Analysis**

PlanetScope
- Orthorectified
- Radiometrically Calibrated
- Surface Reflectance
- Harmonized with Sentinel-2

SkySat
- Orthorectified
- Pansharpened
- Radiometrically Calibrated
- Surface Reflectance

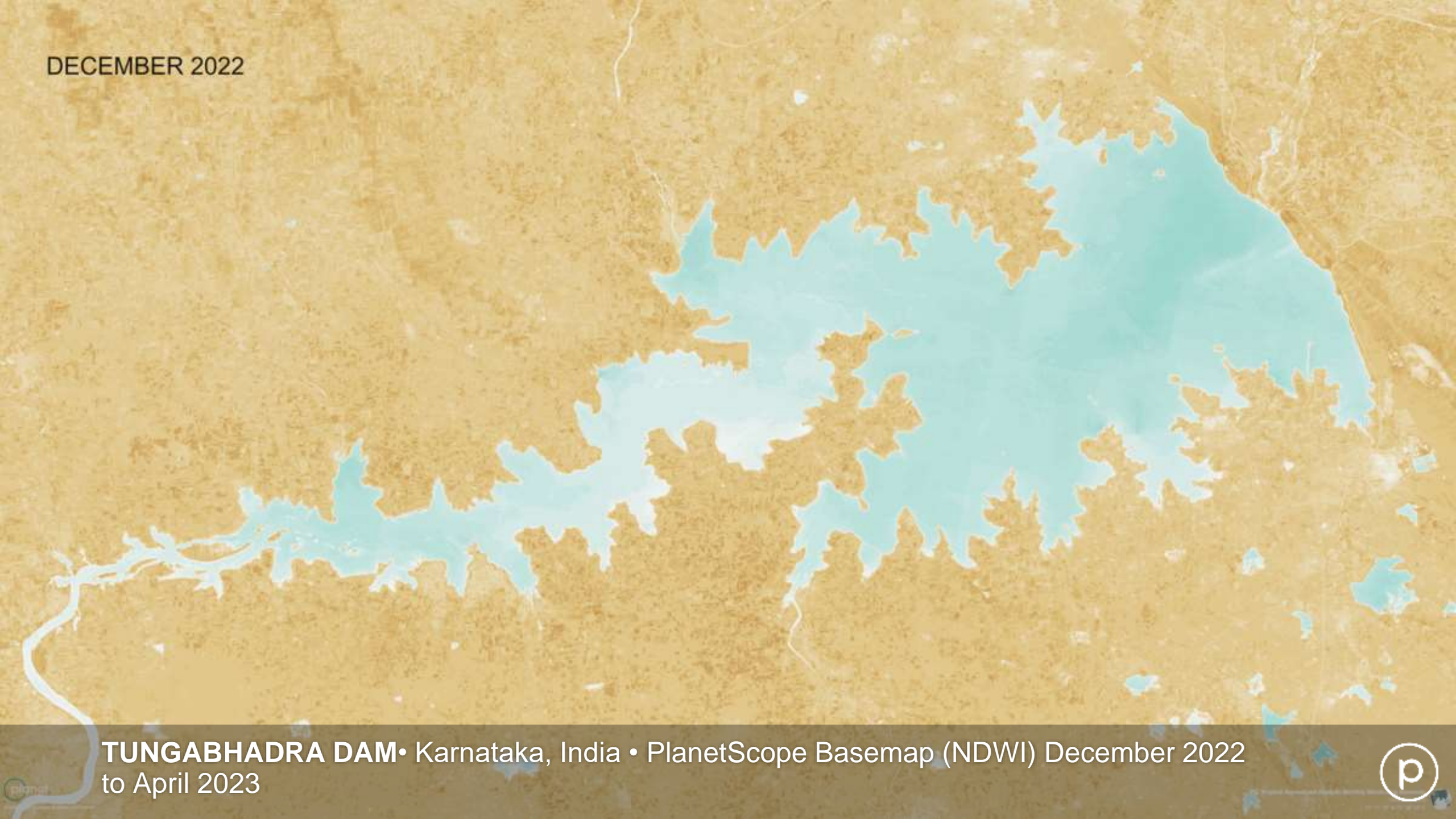→ **Planet Scenes or Planet Basemaps** → **Analysis**

Drought in Karnataka
195 Talukas in Karnatka are Drought Affected
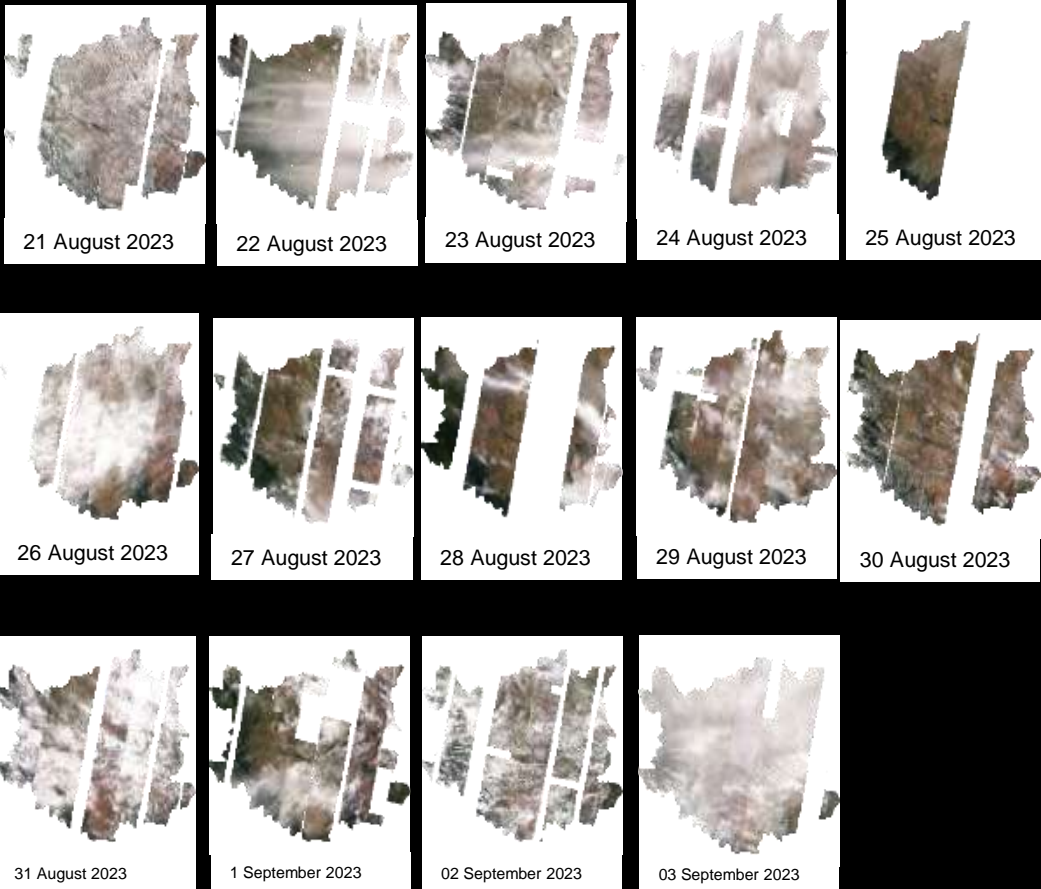
DECEMBER 2022

TUNGABHADRA DAM• Karnataka, India • PlanetScope Basemap (NDWI) December 2022 to April 2023

Planet offer Analysis Ready Data (ARD) Mosaic

PLANESCOPE MONITORING

PlanetScope BASEMAP

21 August 2023 | 22 August 2023 | 23 August 2023 | 24 August 2023 | 25 August 2023

26 August 2023 | 27 August 2023 | 28 August 2023 | 29 August 2023 | 30 August 2023

31 August 2023 | 1 September 2023 | 02 September 2023 | 03 September 2023
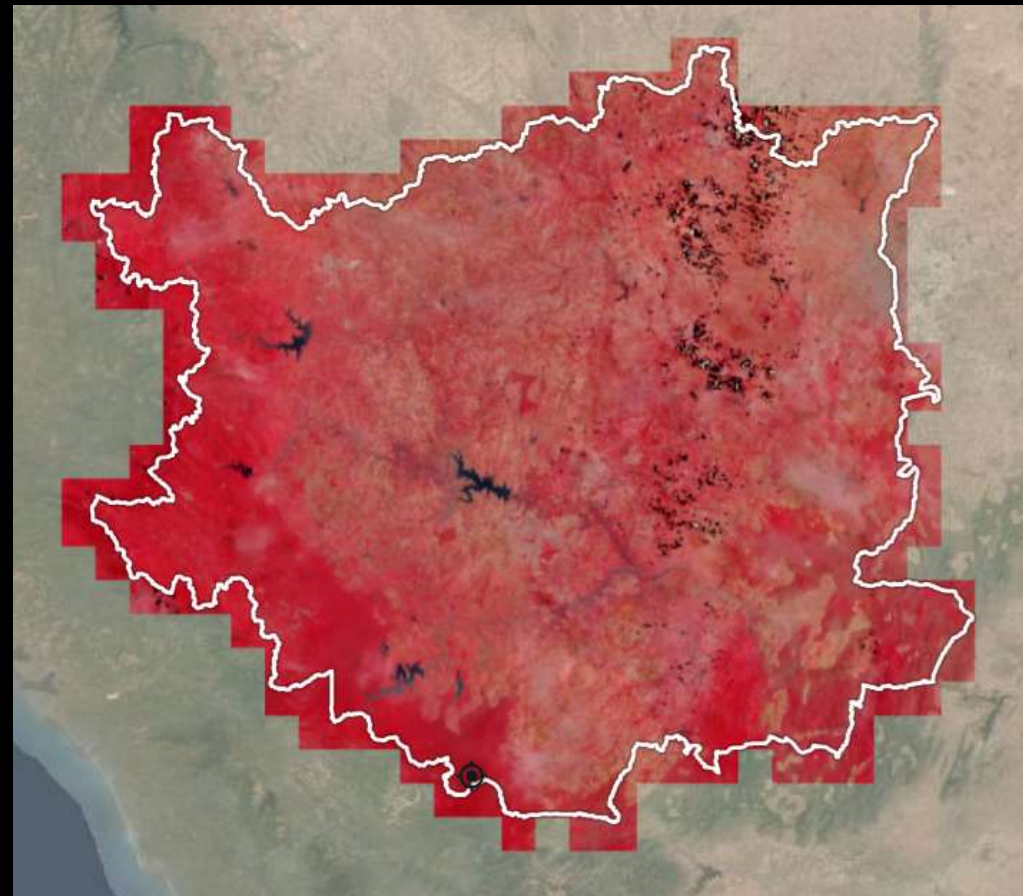
Cauvery Basin. 8 Band PlanetScope Monitoring & Basemap 21st August 2023 – 3rd September 2023

Planet Soil Water Content (SWC) for Karnataka

NASA SMAP

NASA GPM

JAXA AMSR-2

ESA SMOS & Sentinels

- Soil water content [m³/m³]
- Land surface temperature [K]
- Biomass proxy [-]
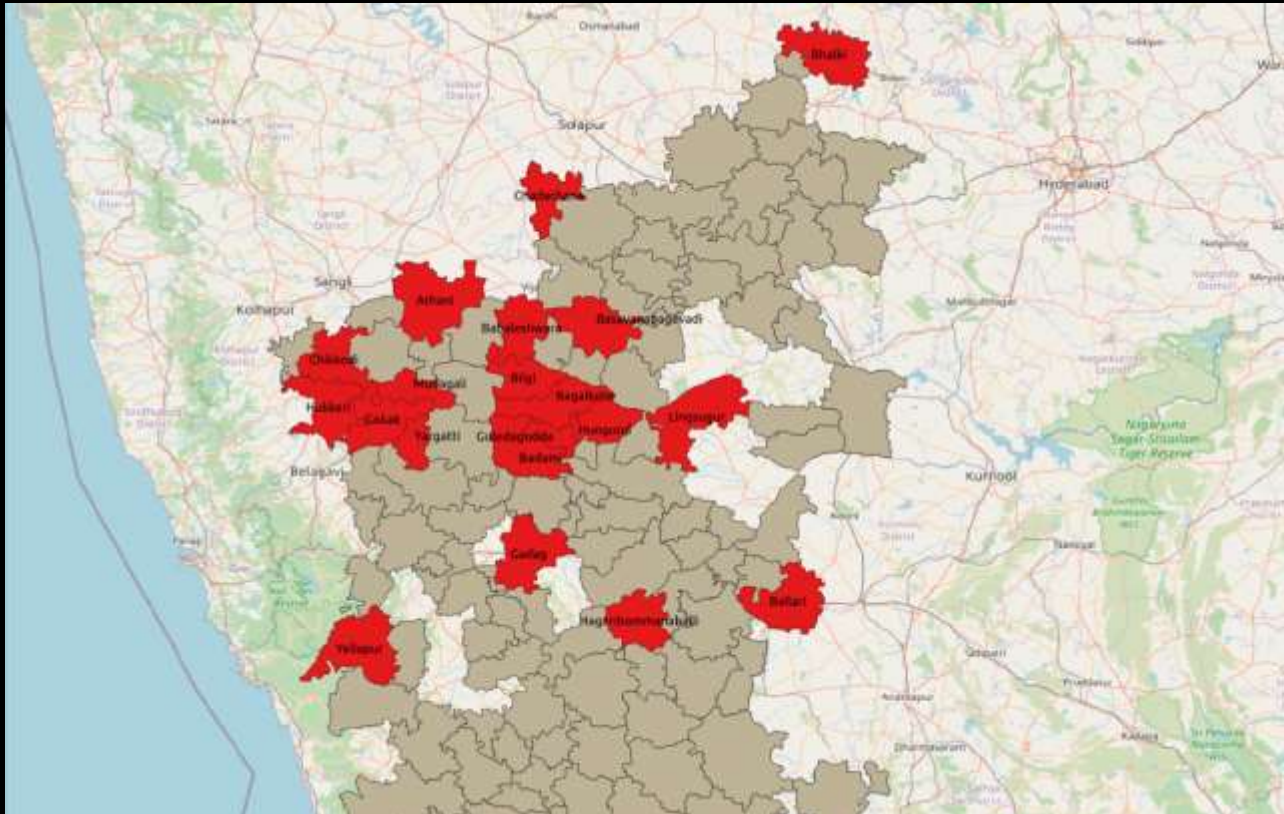
SWC Data
- AMSR2 C Band downscaled to 1 km
- Data available from July 2012 till date [14 Sept]
- Product specification Link

Drought Indications used
- LPA - Long Period Average ("Climatology") from 26 July 2012 till 14 Sept 2023
- 15-day moving averages used for excess/ deficit of SWC of current year from 1 Jan 2023 ["Anomalies"), as compared to LPA
- Moving averages for gap filling and smoothening of data [revisit frequency of AMSR2 over the region is 4-5 times per week approx.)
- Cumulative negative anomalies of deficit SWC [ignoring excess or positive anomalies)
- calculated for dry periods showing peak accumulated deficit and duration

Planet Soil Water Content (SWC) for Karnataka
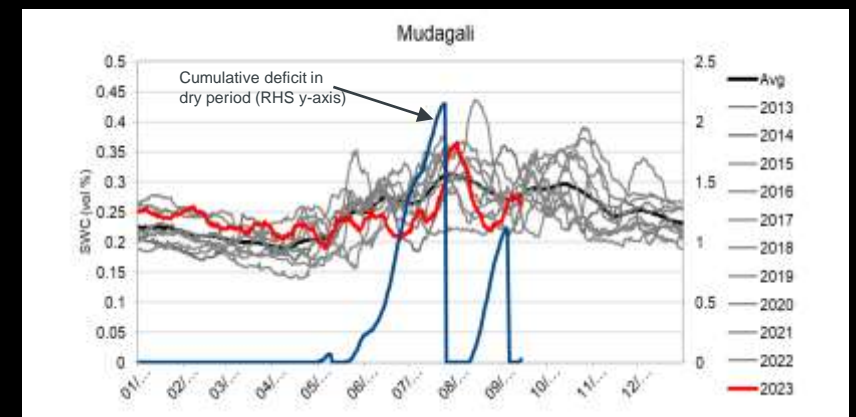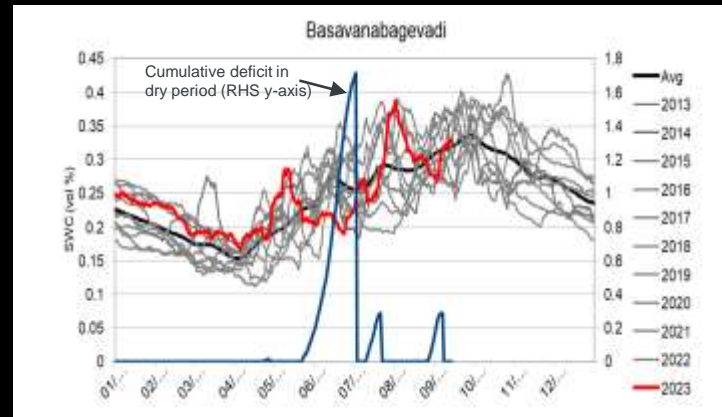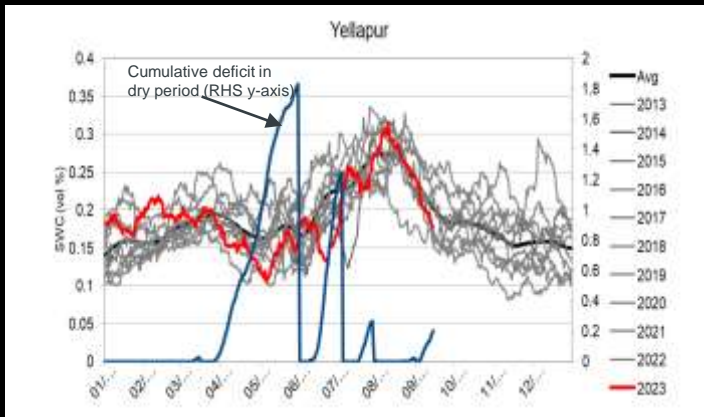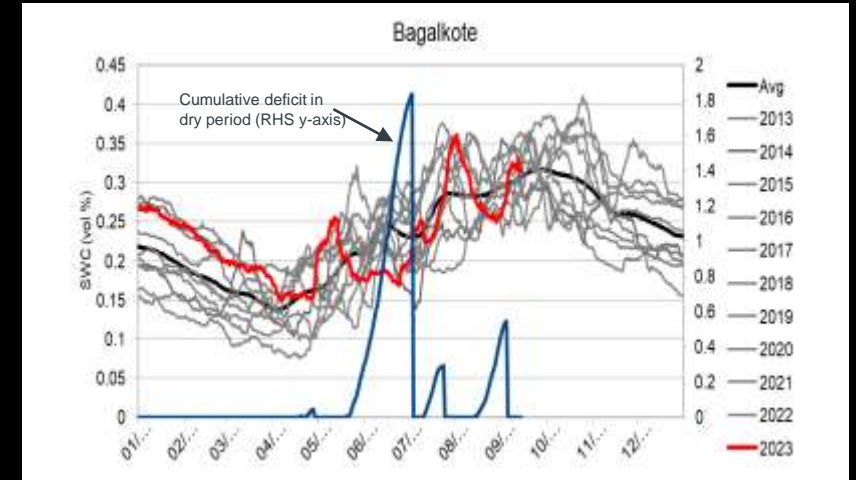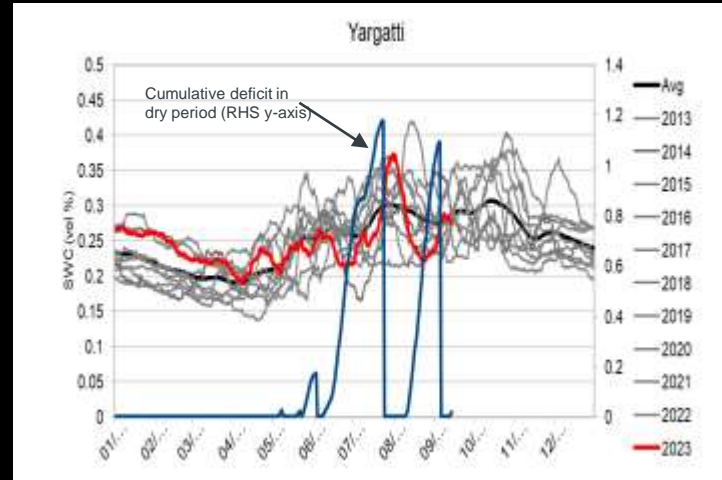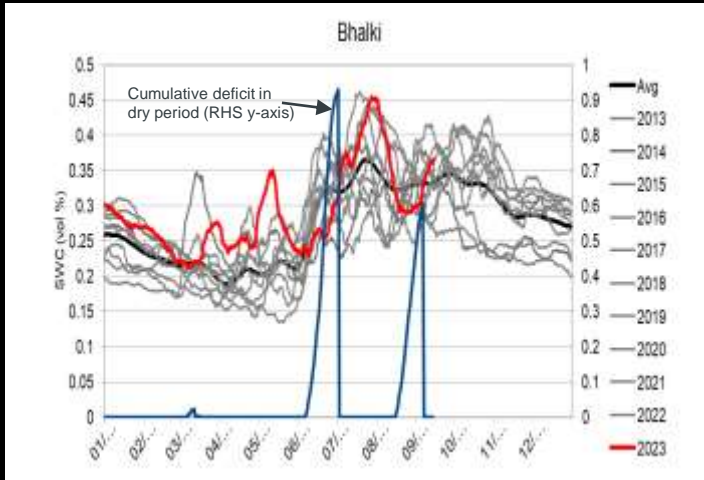
Microsoft AI Tools on Planet Imagery
for Forest Preservation

Figure 1

Figure 2

- Fig 1: Project Guacamaya uses a daily delivery of high-resolution satellite images to train the AI models on tracking the evolution of the Amazon rainforest over time. Image by Planet Labs and SINCHI.

- Fig 2: These images give government officials, public institutions and scientific organizations a top-down view of the massive area the rainforest covers. Image by Planet Labs.

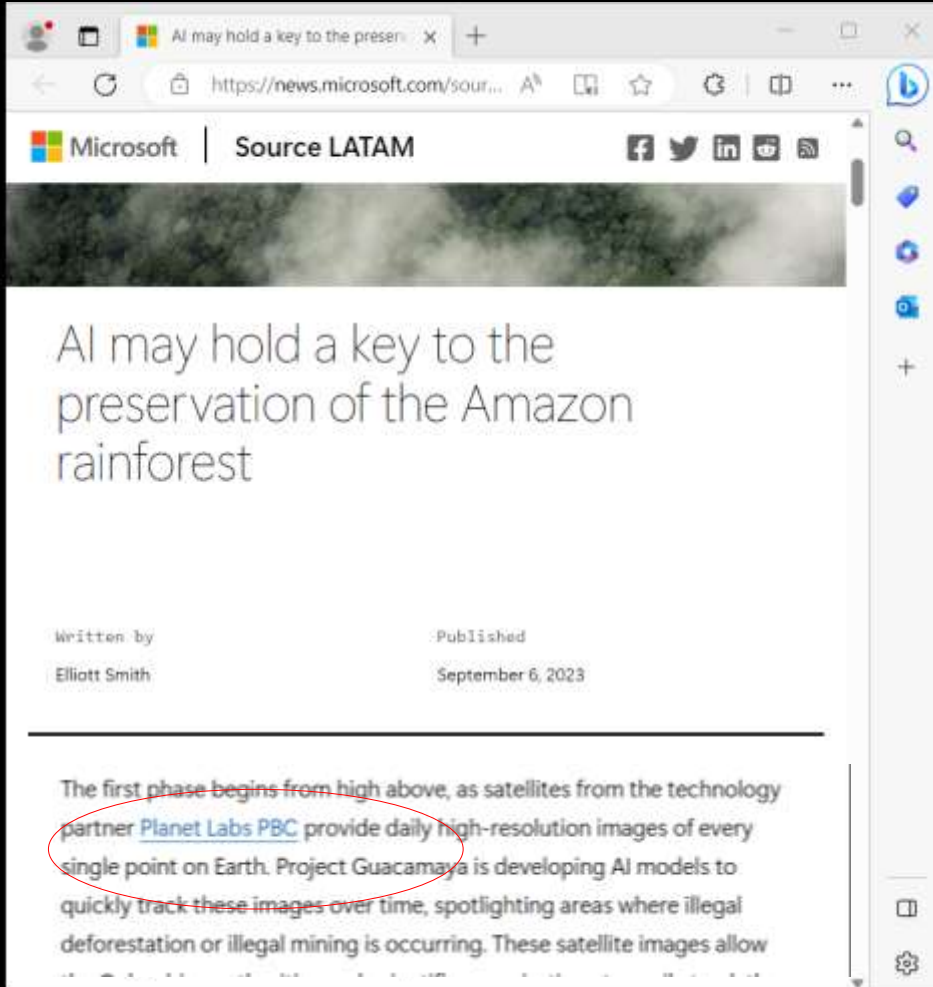# AI Tools on Planet Imagery for Damage Asessment of Maui Wildfire, Hawaii

An aerial image taken on August 10, 2023 shows destroyed homes and buildings burned to the ground in Lahaina in the aftermath of wildfires in western Maui, Hawaii. Photo by Patrick T. Fallon / AFP. AFP VIA GETTY IMAGES

Using satellite imagery by Planet, a Microsoft AI tool compared the pictures before and after the fire and made maps to help organizations like the Red Cross assess the damages.

Why PlanetScope?
- Imagery on the date of disaster
- Imagery just after the disaster
- High Spatial Resolution
- Daily imagery

Lahaina Building Damage Assessment

Damage level [number of buildings] [2810]

- 0 - 20% [1088]
- 20% - 40% [110]
- 40% - 60% [169]
- 60% - 80% [238]
- 80% - 100% [1205]

MAUI WILDFIRE• Hawaii• August 10, 2023

Accenture and Planet for AI Powered Geospatial Intelligence

Water Impoundment/ Lake on Rishi Ganga River near Raini Village, Uttarakhand

Planet (Skysat-4) Image 23 Feb, 2021

Date of Issue : 23.02.2021
DISASTER EVENT ID: 01-FLD-2021-UK
MAP ID: 2021/27
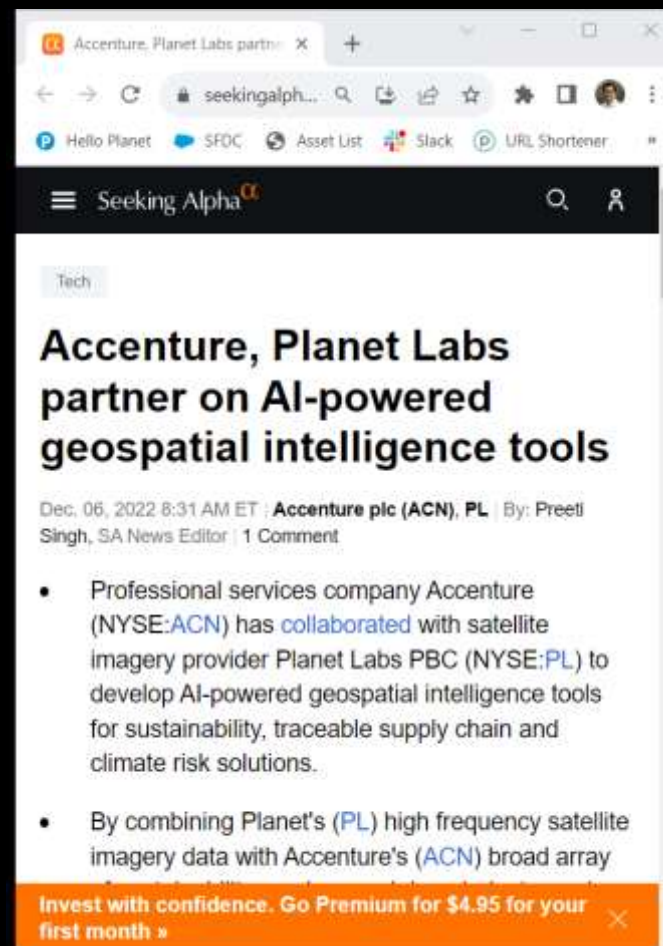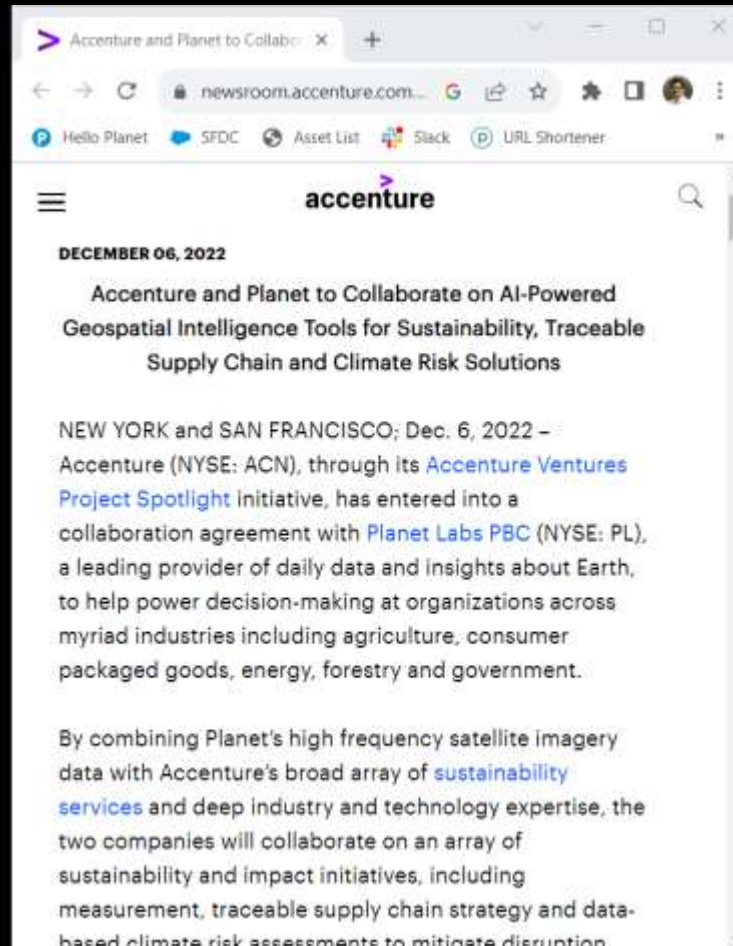
Water Impoundment on Rishi Ganga

Source: NRSC Website (https://www.nrsc.gov.in/sites/default/files/pdf/DMSP/planetemx-23feb-fulllake.jpg

Image: Planet SkySat

NASA Expands Contract with Pla... ×   +

← → C   🔒 earthdata.nasa.gov/learn/articles/planet-contract-expansion

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NASA
EARTHDATA
OPEN ACCESS FOR OPEN SCIENCE
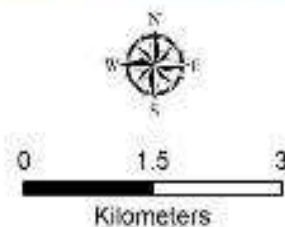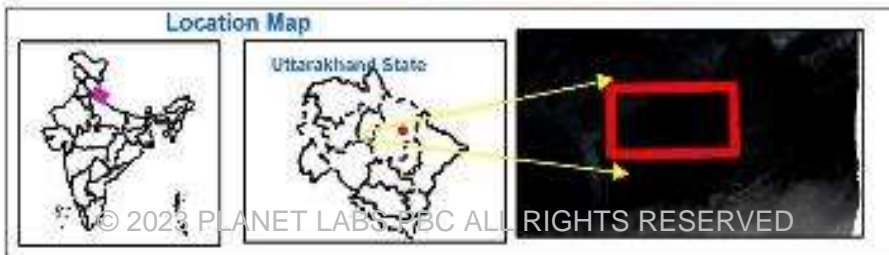
Data   Topics   Learn   Engage   About   🔍

NASA Expands Contract with Planet Labs Inc. for Satellite Imagery

The contract expansion significantly broadens the availability of Planet imagery distributed by NASA's Commercial Smallsat Data Acquisition (CSDA) program.

Josh Blumenfeld
Jul 26, 2021

Satellite data provider Planet Labs Inc. (Planet) received a NASA contract expansion to provide satellite imagery for scientific purposes to all U.S. federal civilian agencies, the National Science Foundation (NSF), and all federally- and NSF-funded contractors, subcontractors, partners, and grantees. This exceptionally broad access to Planet imagery applies to roughly 280,000 eligible data users across the U.S. federal government, according to Planet.

planet.

Planet imagery is provided through NASA's Commercial Smallsat Data Acquisition (CSDA) Program, and the contract modification expands access to imagery from

Technologies

Commercial Data

Smallsat

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Planet True Color Imagery	Single-Scene Damage Detection (Reds)

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PlanetScope DATA

Discover how to access PlanetScope data.

ACCESS MISSION DATA

Planet's broad suite of solutions

CAPTURE		ENHANCE		ANALYZE
Monitoring	**Tasking**	**Basemaps**	**Archive**	**Analytic Feeds**
PlanetScope 3.7 m imagery updated on a near-daily basis	SkySat imagery tasking with the highest intraday revisit capability commercially available	Visually consistent and scientifically accurate imagery over broad areas	Access to proprietary datasets back to 2009 and public datasets back to 1972	Detection and analytic capabilities layered on top of Planet Monitoring and Basemaps

Any Questions?

For more information, you may find us here:

🌐 **planet.com**   in **@planet**   🐦 **@planet**

Partha Ghosh
partha@planet.com