Being resilient in times of crisis with Earth observation data: managing risks and improving sustainability

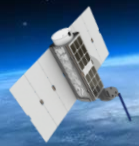
Dr. Erik Zillmann, Nikola Strah, 2.11.2022, Praha

PRAGUE · Czech Republic · April 23, 2022

Agenda

1. Planet Examples
2. Planet Overview
3. Planet + ArcGIS
4. Future of Planet

You can’t fix what you can’t see.

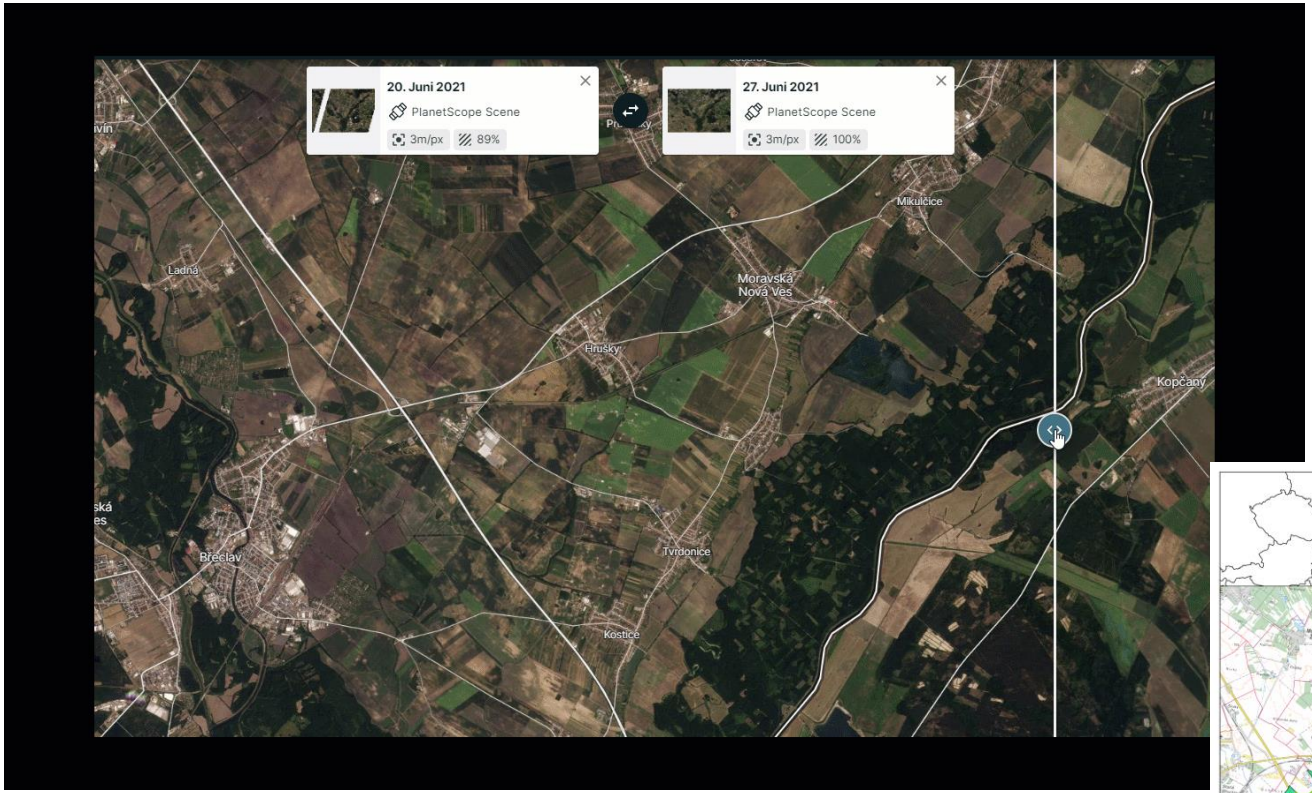


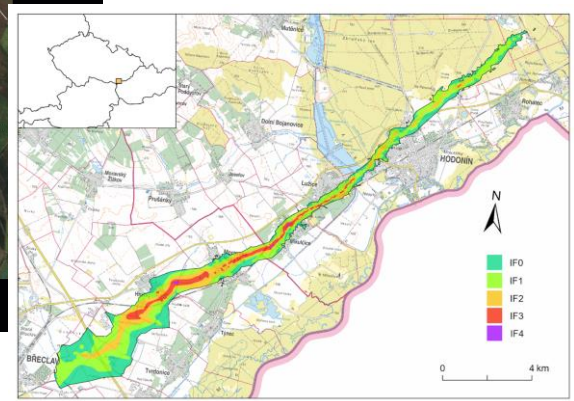
AIRBASE · Kherson, Ukraine · February 28, 2022

AIRBASE · Kherson, Ukraine · March 15, 2022

AIRBASE · Kherson, Ukraine · March 16, 2022

Tornado in Southeast Czechia on 24 June 2021





Wild Fire Monitoring
Bierbrza NP, Poland, 2020

FOREST FIRE MONITORING (19th April 2020)

Bierbrza NP, Poland 2020 – PlanetScope 3m

8th April 2020

FOREST FIRE MONITORING

Bierbrza NP, Poland 2020 – PlanetScope 3m

22th April 2020

FOREST FIRE MONITORING

Bierbrza NP, Poland 2020 – SkySat 0.5 m

23th April 2020
High-resolution image

FOREST FIRE MONITORING

Bierbrza NP, Poland 2020 – SkySat 0.5 m

23th April 2020
High-resolution image

FOREST FIRE MONITORING

Bierbrza NP, Poland 2020

TWO FUNDAMENTAL GLOBAL SHIFTS

DIGITAL TRANSFORMATION

Big data & AI are unleashing a huge new (multi-€Tn) Digital Transformation across various industries from Agriculture to Transportation to Forestry to Government.

SUSTAINABILITY TRANSFORMATION

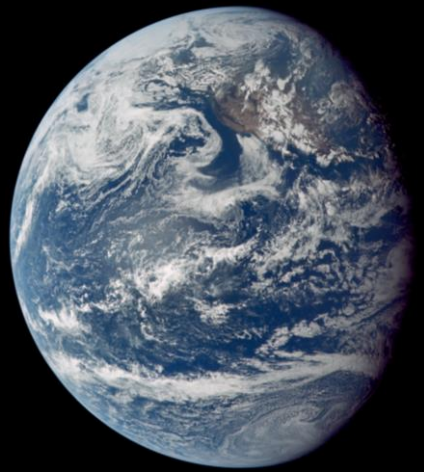
Planet can help countries measure their regulations, banks measure their green bonds, companies their ESG goals; valuing natural systems in the economy.

ARTIFICIAL INTELLIGENCE (AI/KI) = ALGORITHMS + DATA

ENGINE ***FUEL***

Meeting the Sustainable Development Goals

Meeting the Sustainable Development Goals



We provide the solution

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

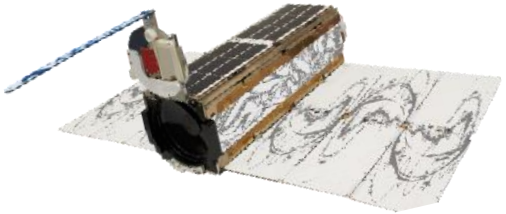
Planet's Constellation – Largest Satellite Fleet

Monitor your areas of interest, discover patterns, and get timely insights

PlanetScope Satellites

Always-on, Broad Area Monitoring

~180

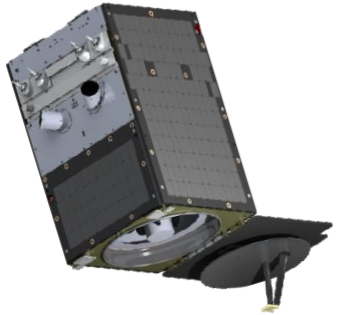


- 3.0/4.0 meter resolution
- Daily imagery collection, no tasking required
- 8 bands: from coastal blue to near-infrared
- Red-Edge band (SuperDoves)
- Archive back to 2014

SkySat Satellites

Rapid Revisit, Targeted Monitoring

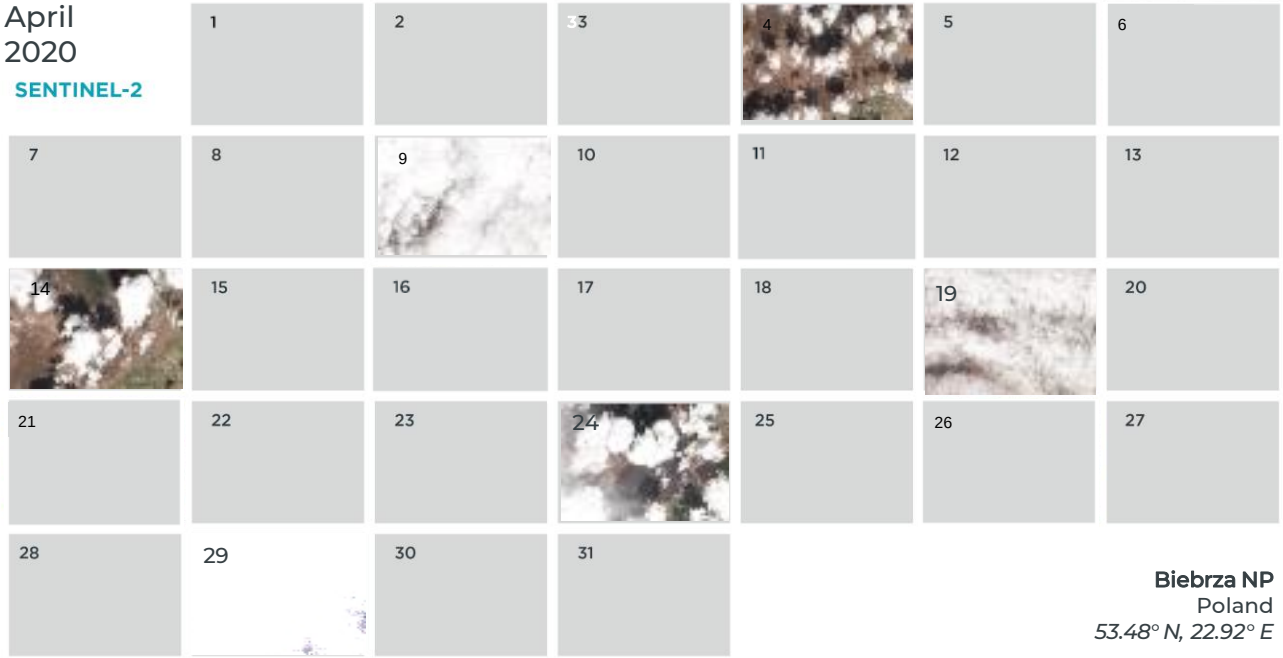
21



- 0.5 meter resolution
- Sub-daily imagery tasking
- RGB, NIR, and Pan bands
- Archive back to 2014

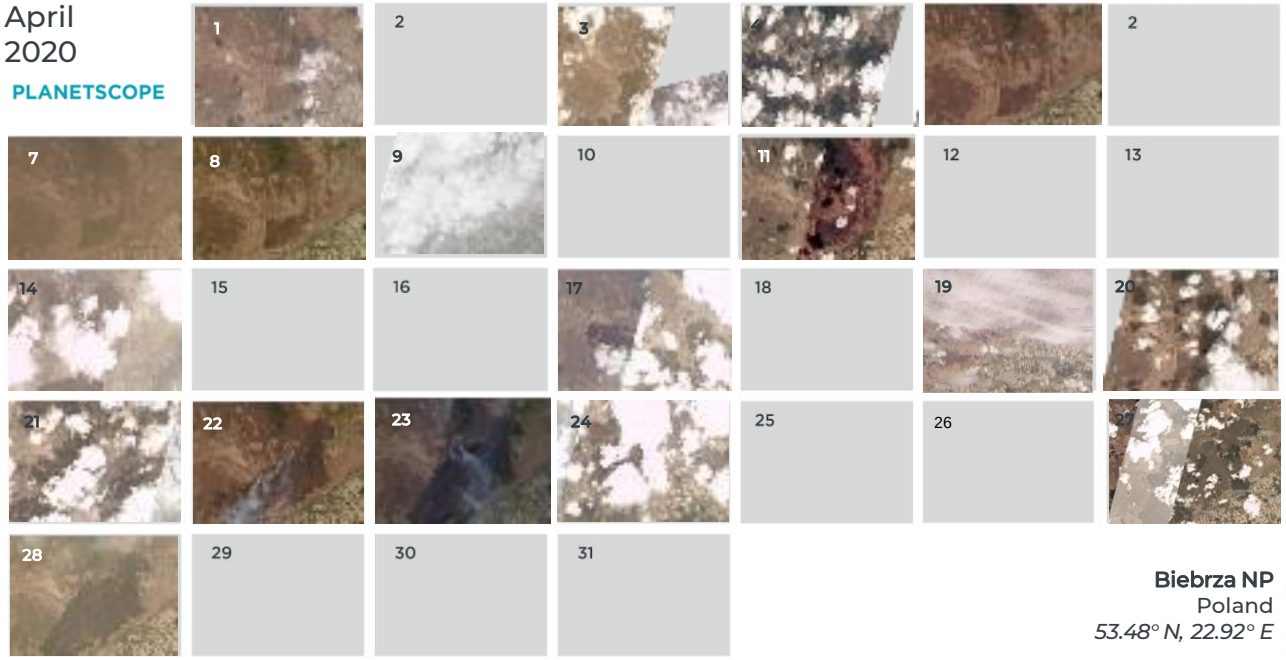
WHY HIGH CADENCE MATTERS?

Available free images at 10 meter resolution



Why High Cadence Matters

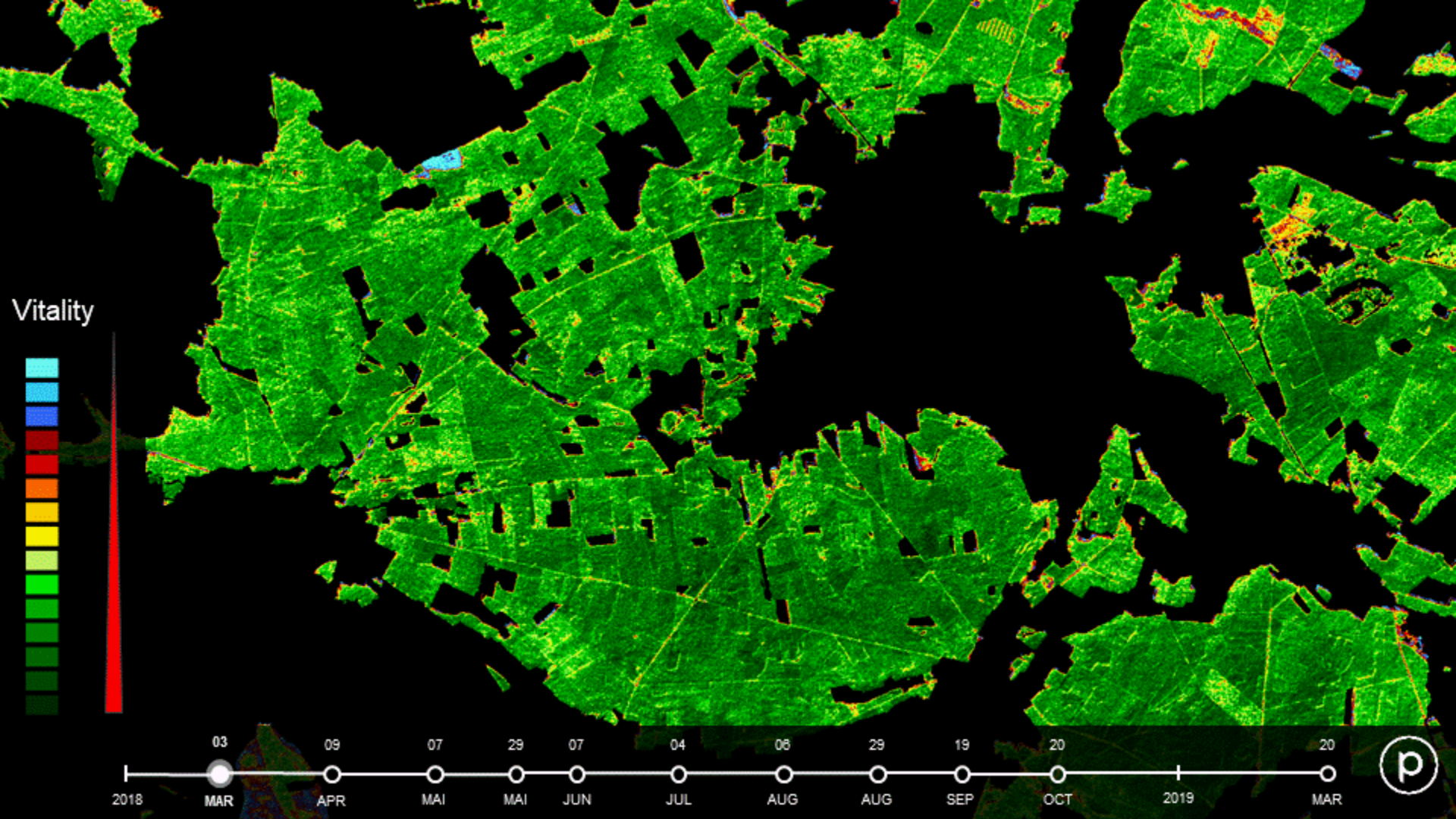
Planet fills in the gaps with 3 meter resolution

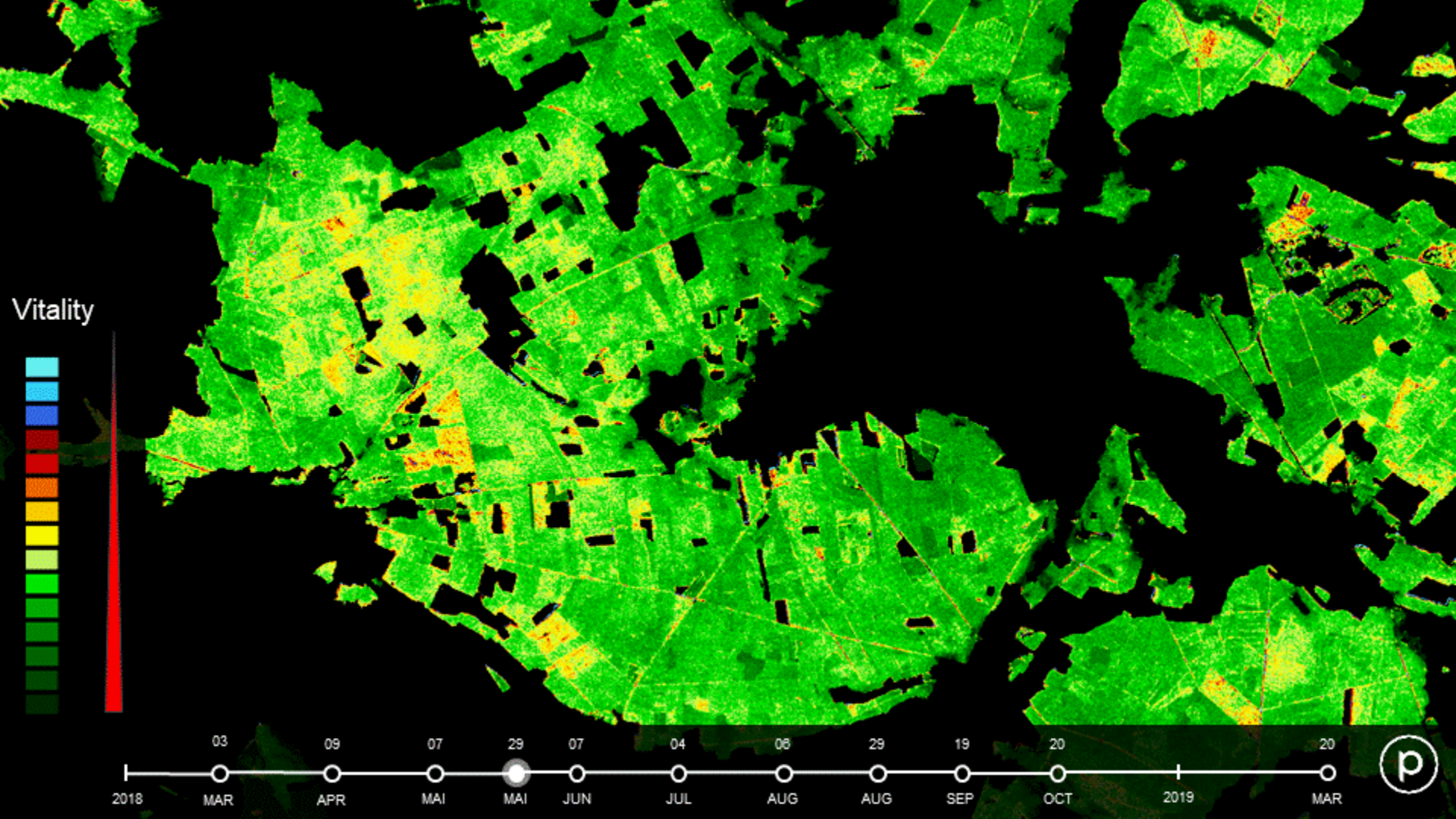


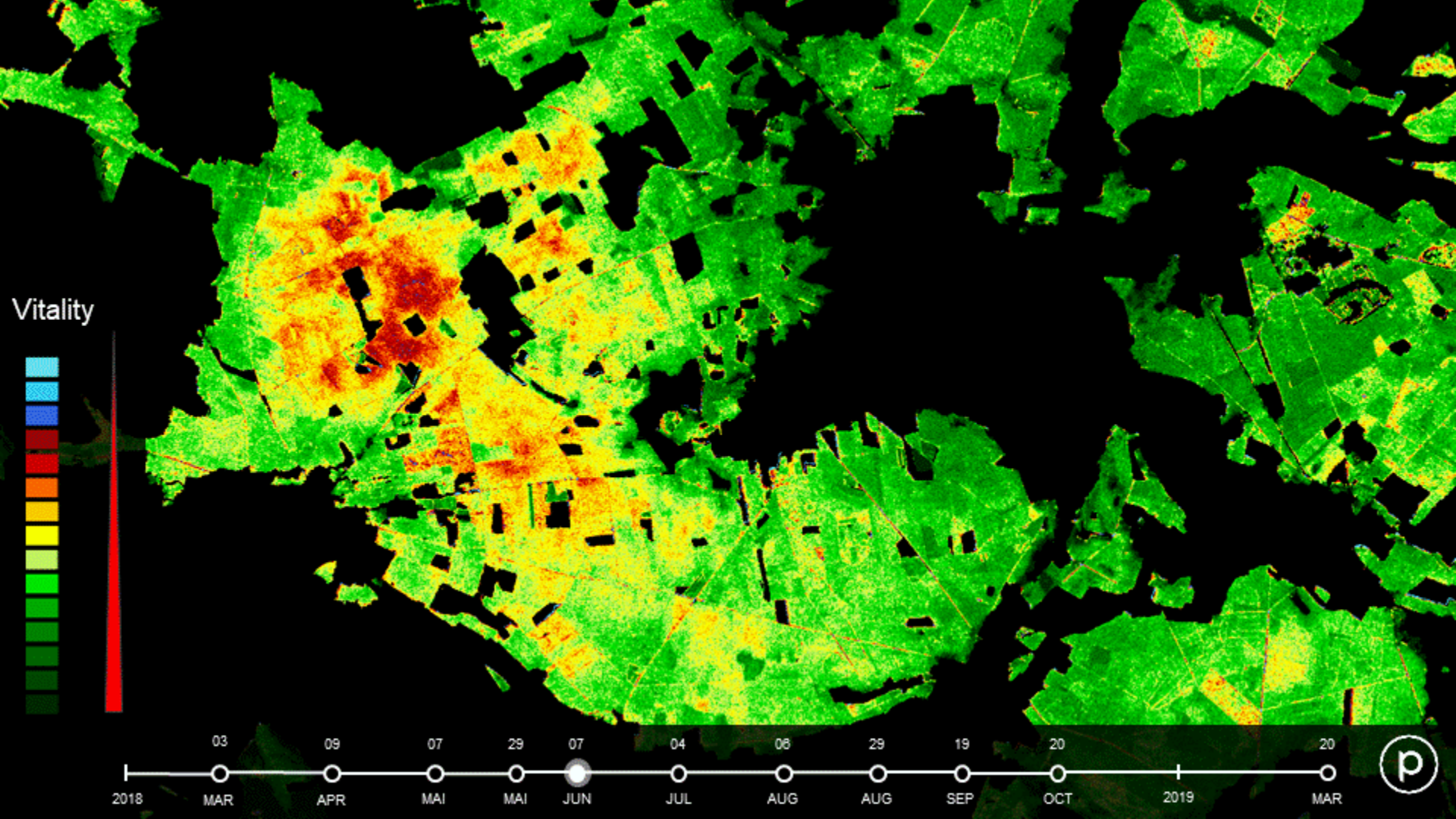
Biebrza NP
Poland
53.48° N, 22.92° E

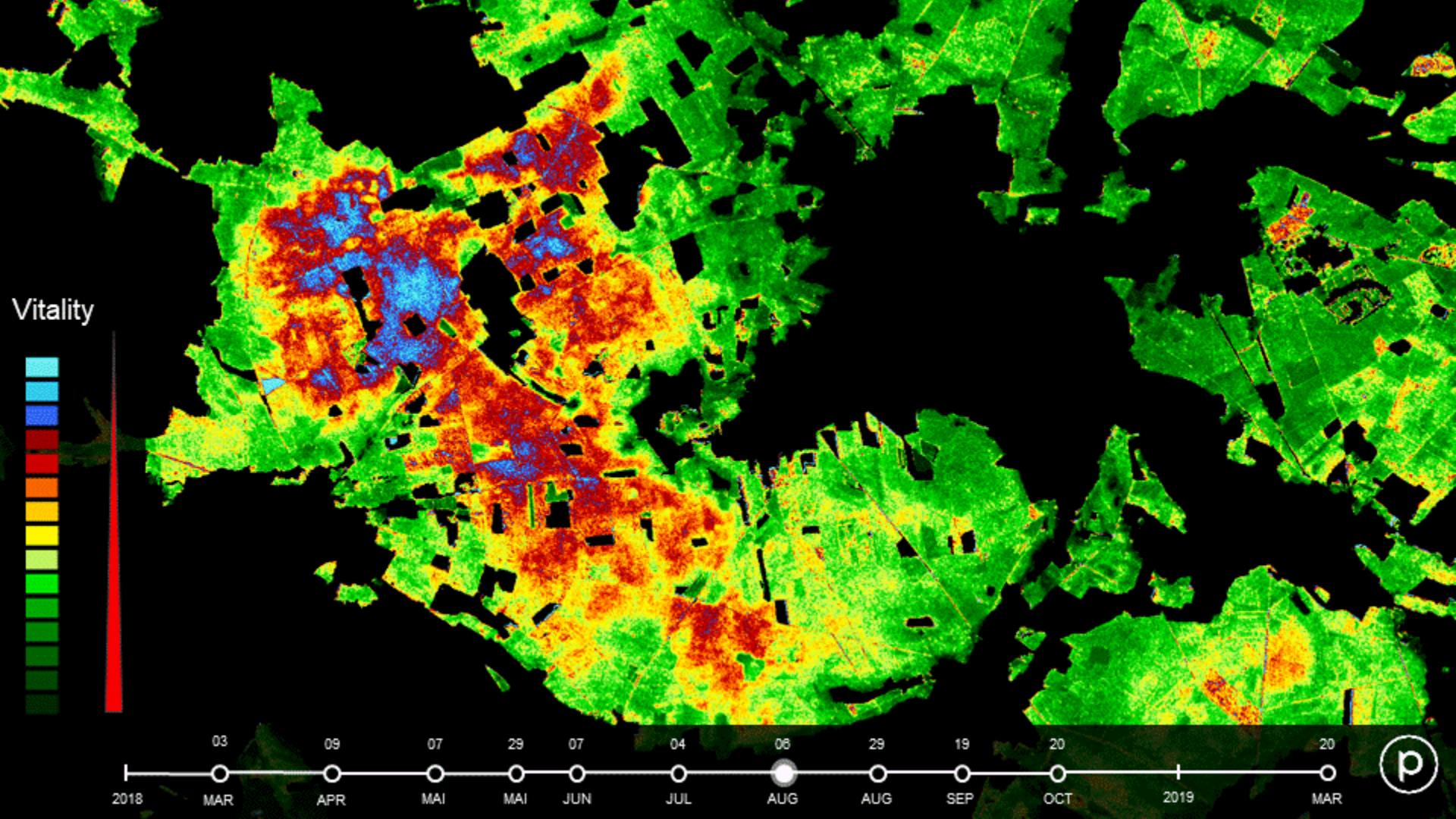
Forest Vitality Monitoring Brandenburg, Germany, 2018

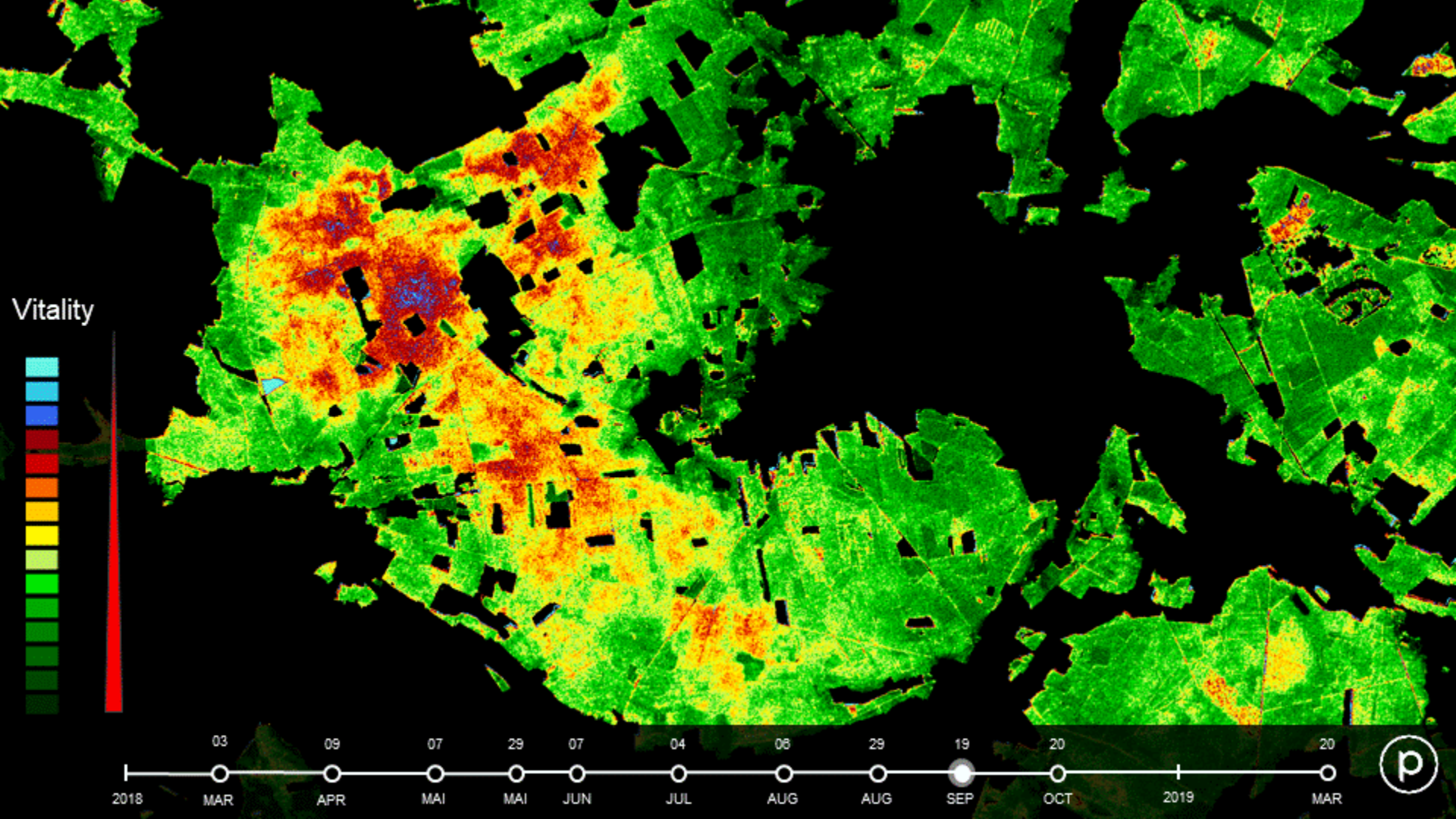

2018
03
MAR
09
APR
07
MAI
29
MAI
07
JUN
04
JUL
06
AUG
29
AUG
19
SEP
20
OCT
2019
20
MAR

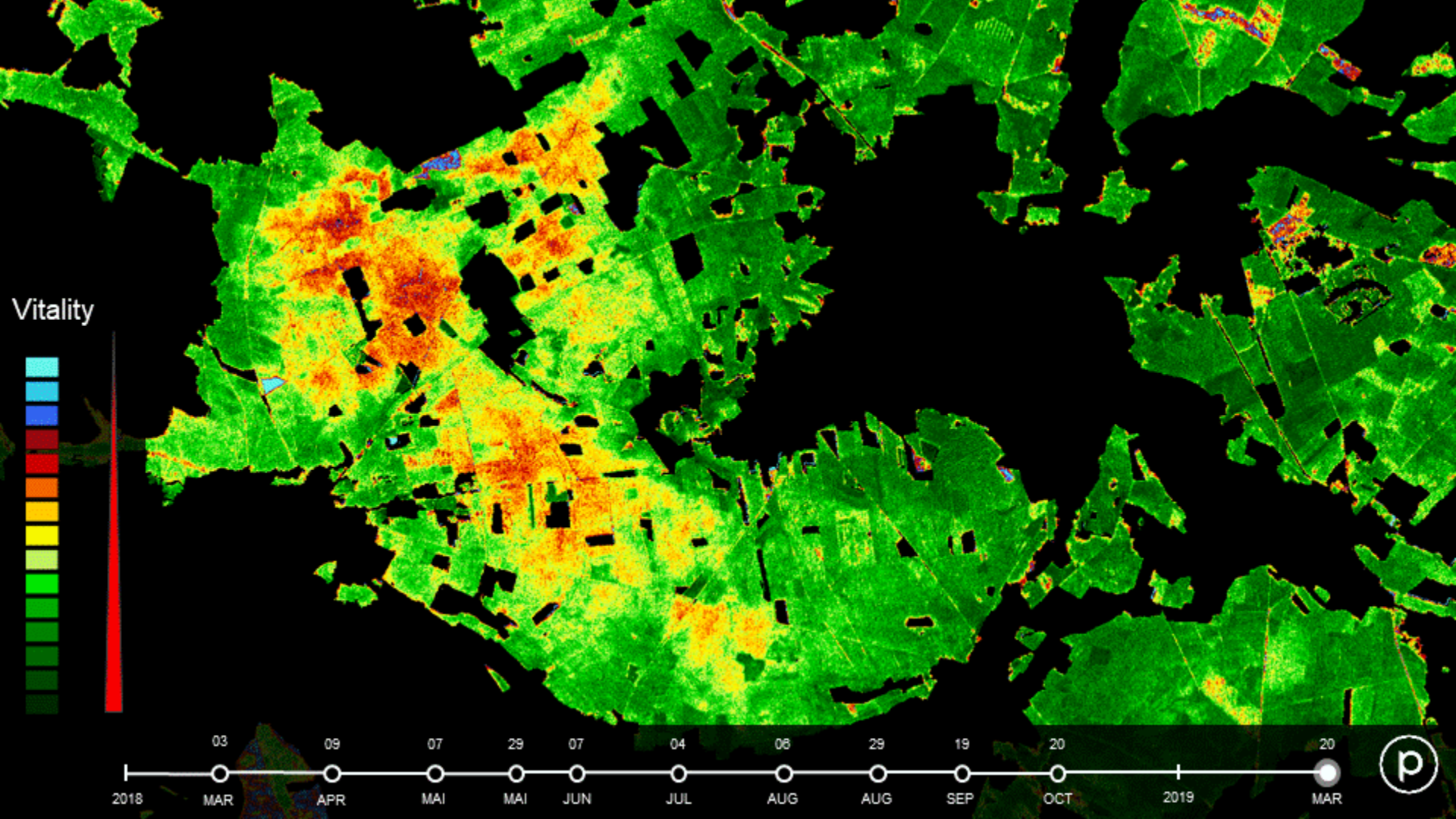

Vitality
03
09
07
29
07
04
06
29
19
20
20
2018
MAR
APR
MAI
MAI
JUN
JUL
AUG
AUG
SEP
OCT
2019
MAR

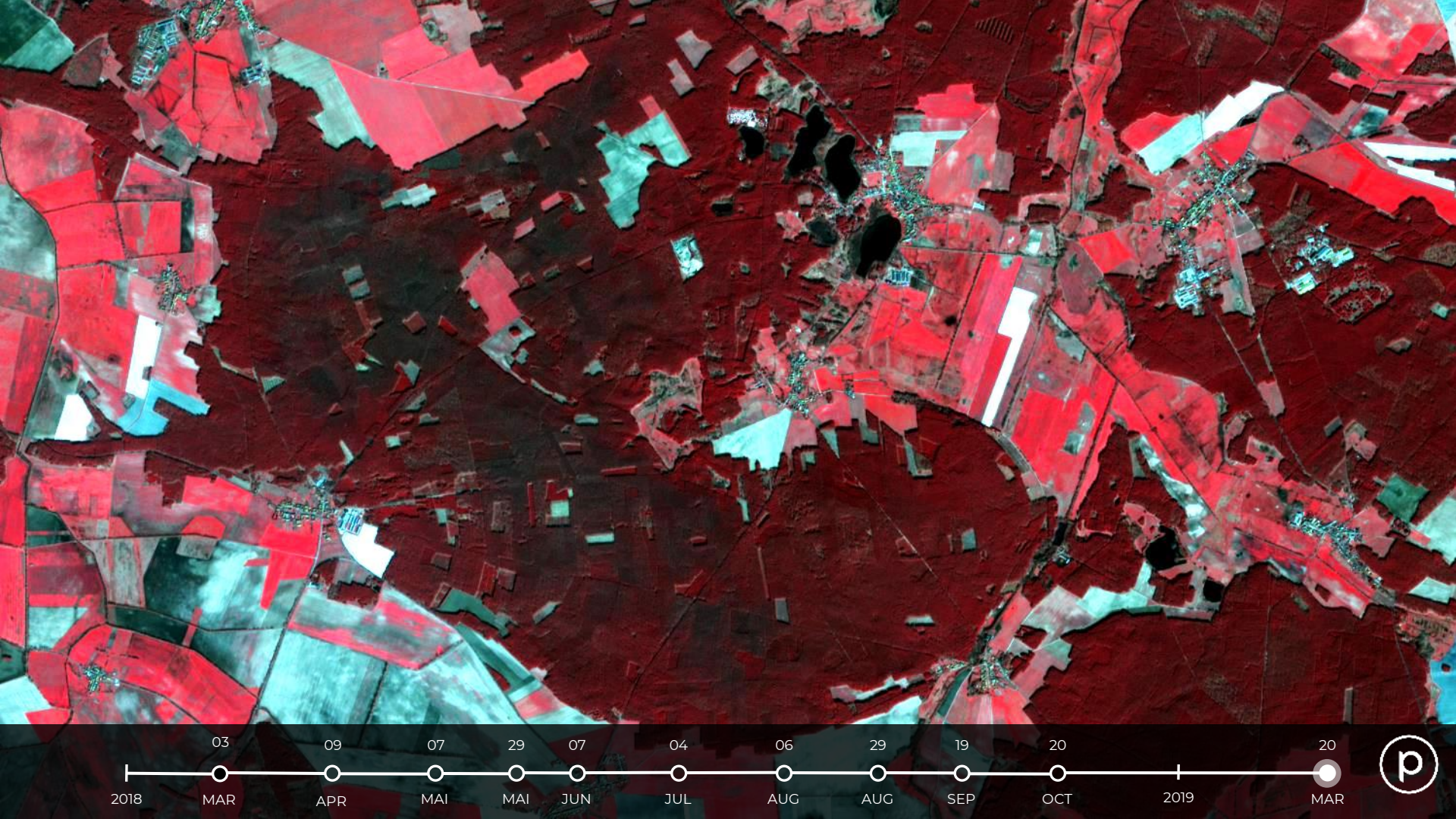

Vitality
03
09
07
29
07
04
06
29
19
20
20
2018
MAR
APR
MAI
MAI
JUN
JUL
AUG
AUG
SEP
OCT
2019
MAR


Vitality
03
09
07
29
07
04
06
29
19
20
20
2018
MAR
APR
MAI
MAI
JUN
JUL
AUG
AUG
SEP
OCT
2019
MAR


Vitality
03
09
07
29
07
04
06
29
19
20
20
2018
MAR
APR
MAI
MAI
JUN
JUL
AUG
AUG
SEP
OCT
2019
MAR


Vitality
2018
03 MAR
09 APR
07 MAI
29 MAI
07 JUN
04 JUL
06 AUG
29 AUG
19 SEP
20 OCT
2019
20 MAR


Vitality
03
09
07
29
07
04
06
29
19
20
20
2018
MAR
APR
MAI
MAI
JUN
JUL
AUG
AUG
SEP
OCT
2019
MAR


2018
03 MAR
09 APR
07 MAI
29 MAI
07 JUN
04 JUL
06 AUG
29 AUG
19 SEP
20 OCT
2019
20 MAR

Flood & Debris Flow Monitoring Treffen, Austria, 2022

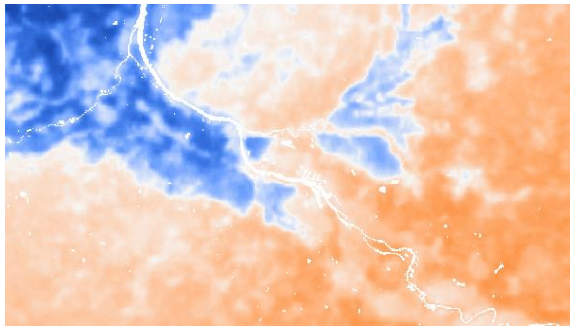
Foto: APA / EXPA / Johann Groder; https://www.derstandard.de/story/2000137106852/unwetter-in-kaernten-zivilschutzwarnung-fuer-treffen-aufgehoben

FLOODING & DEBRIS FLOWS · Treffen, Austria · June 28, 2022

FLOODING & DEBRIS FLOWS · Treffen, Austria · June 30, 2022

We provide three essential planetary variables

Soil Water Content



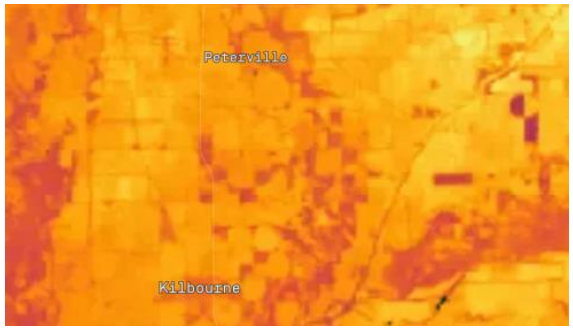
100 x 100 m

Near Real Time

20 years archive

Global

Land Surface Temperature



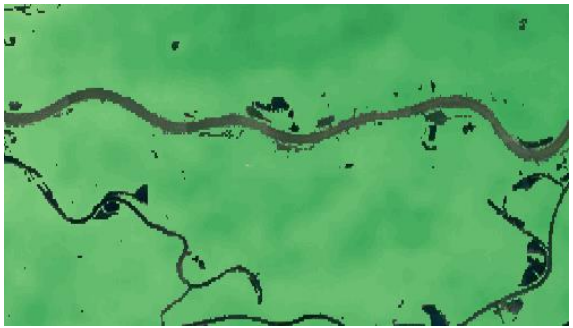
100 x 100 m

Near Real Time

20 years archive

Global

Vegetation Water Content



100 x 100 m

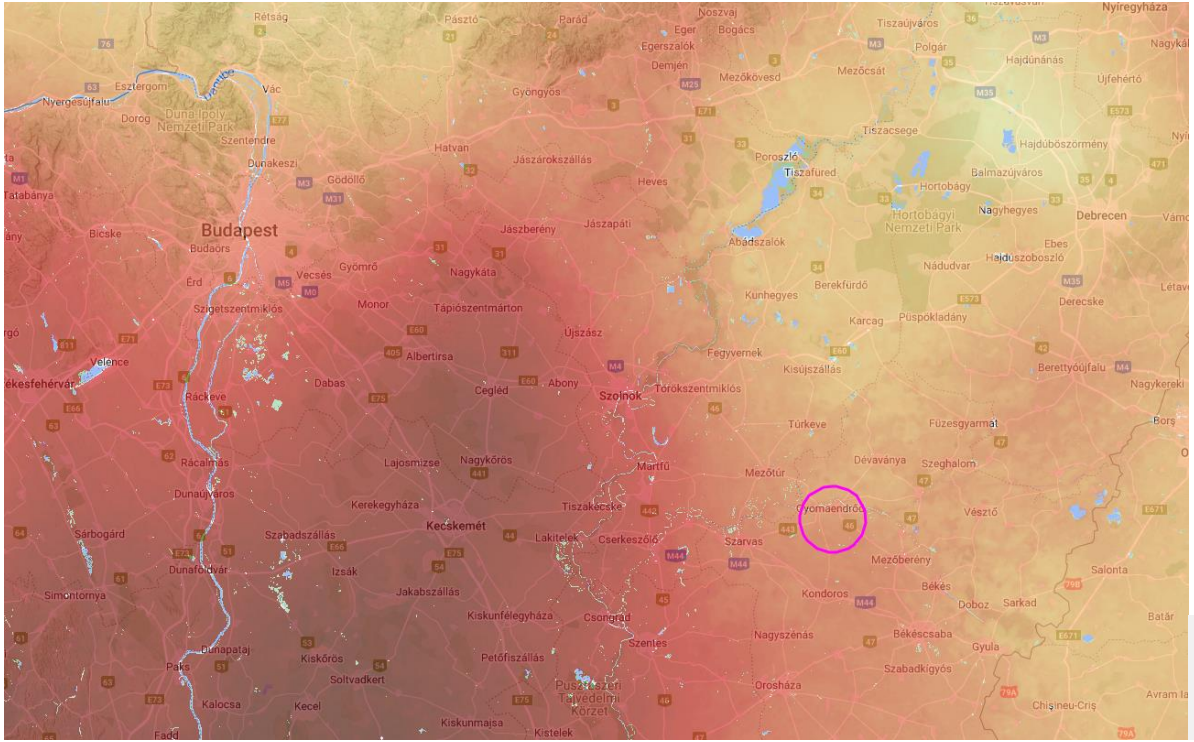
Near Real Time

20 years archive

Global

Satellite Images show how dry Hungary is

Soil Water Content (SWC) Map - 2nd of August 2022



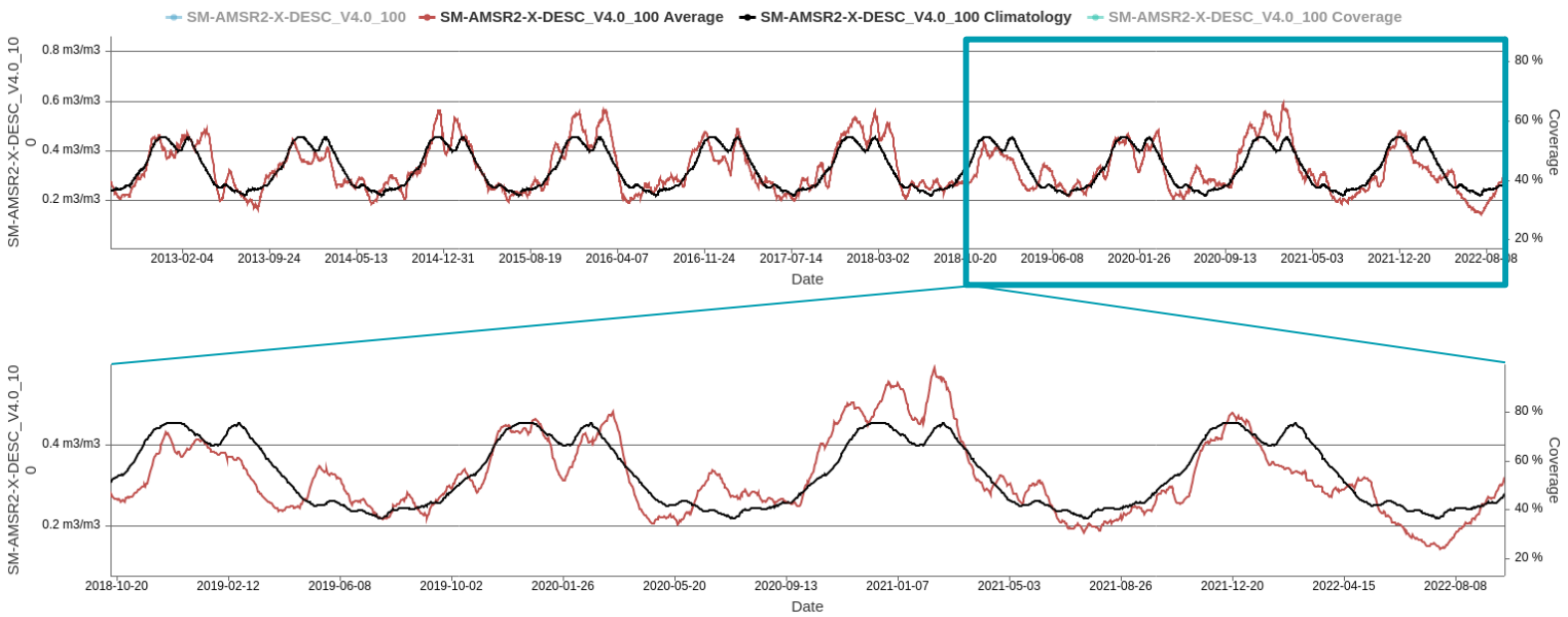
Soil Water Content Map (1x1km) derived from passive microwave data is showing the available water content in the upper 5 cm of the soil on August 2nd 2022.

The values are at the very dry end with max ~0.2 m^3/m^3. Saturation is normally around 0.55 m^3/m^3.

For the purple circle the temporal over several years is shown on the next slide.

Satellite Images show how dry Hungary is

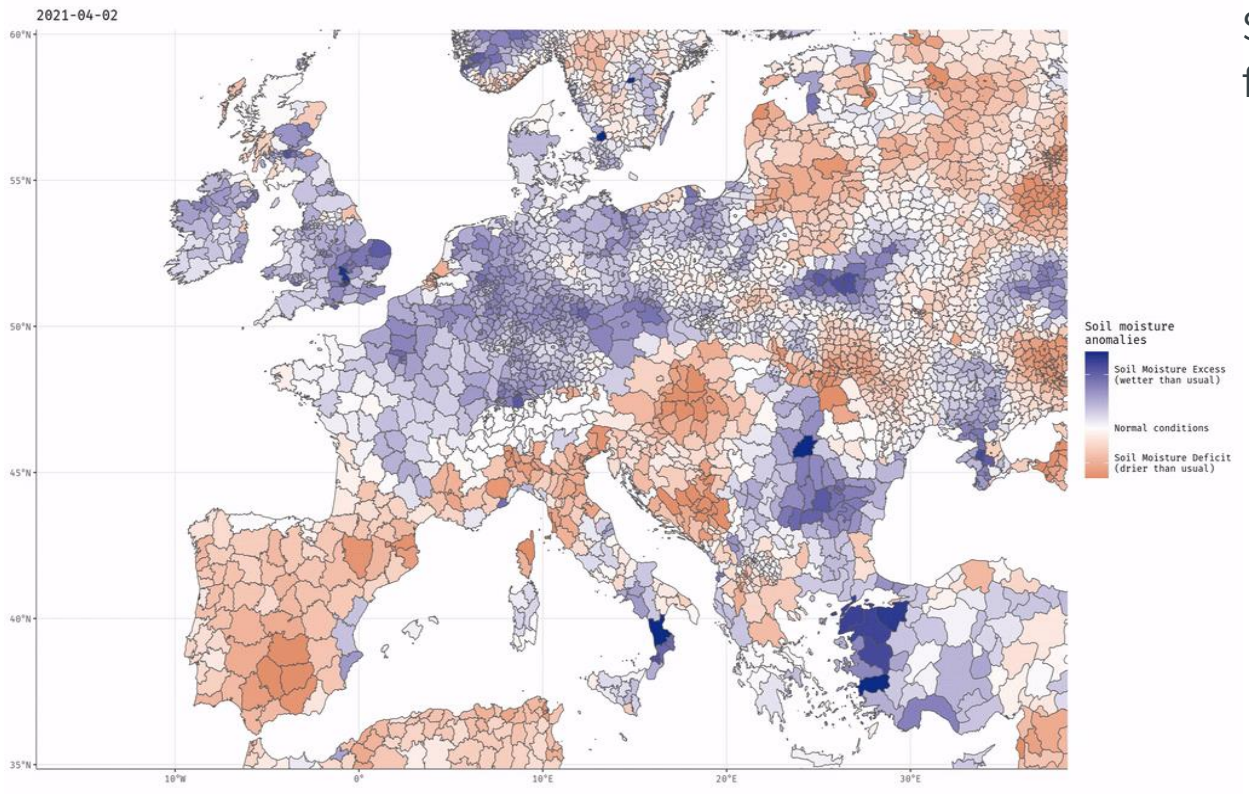
Temporal profile of the Soil Water Content (SWC) - (~46.92° N, 20.81° E)



On Top the SWC for a single pixel is plotted over the course of 9.5 years (red line) showing how moisture levels compare to the long term average of this area (baseline climatology (black line)). At the bottom only the last few years are shown, to better visualize how much lower the soil moisture goes in 2022 as compared to e.g. 2019 and 2021, which were already a dry years.

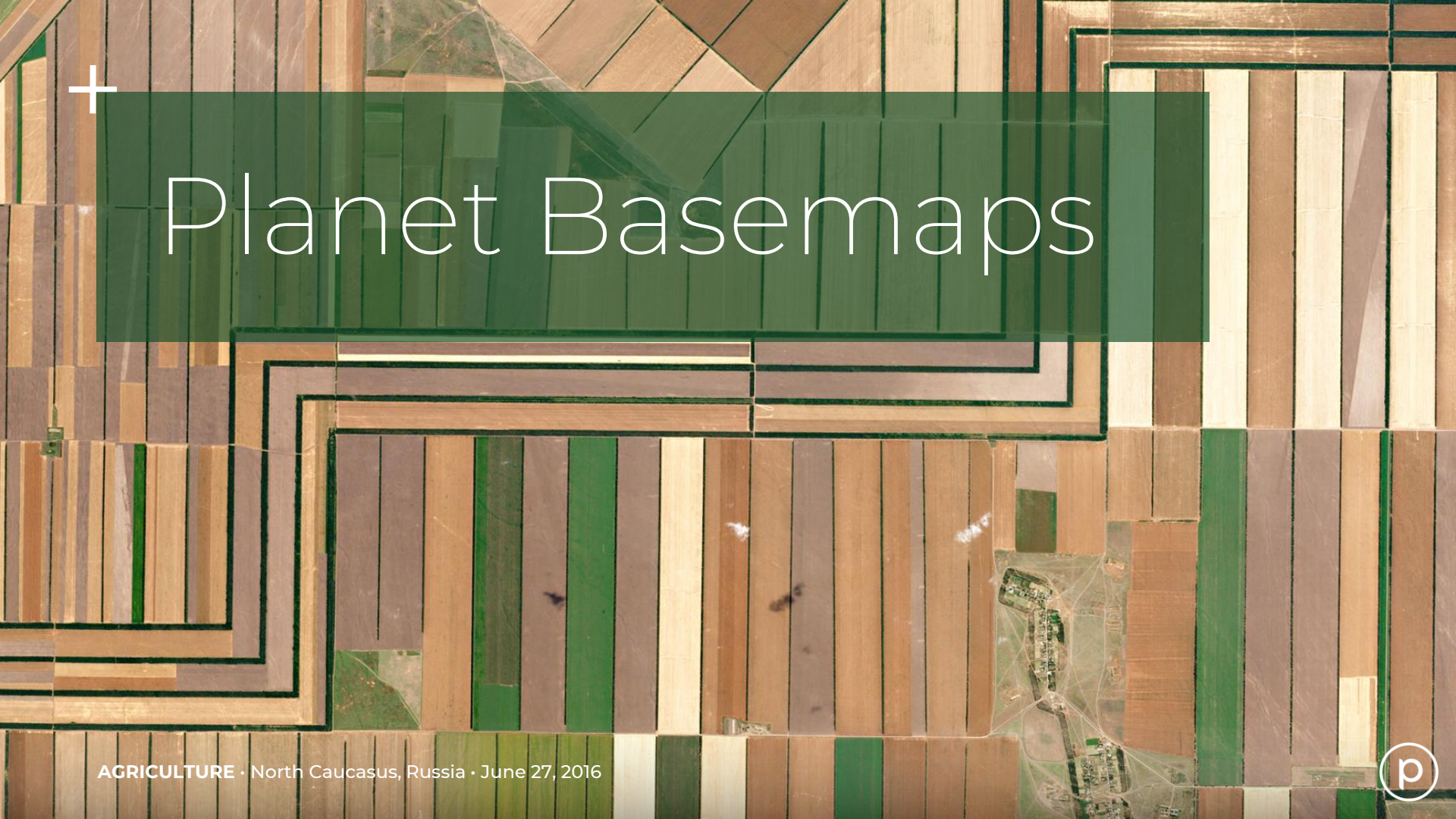
Drought Monitoring

Daily soil moisture data feed

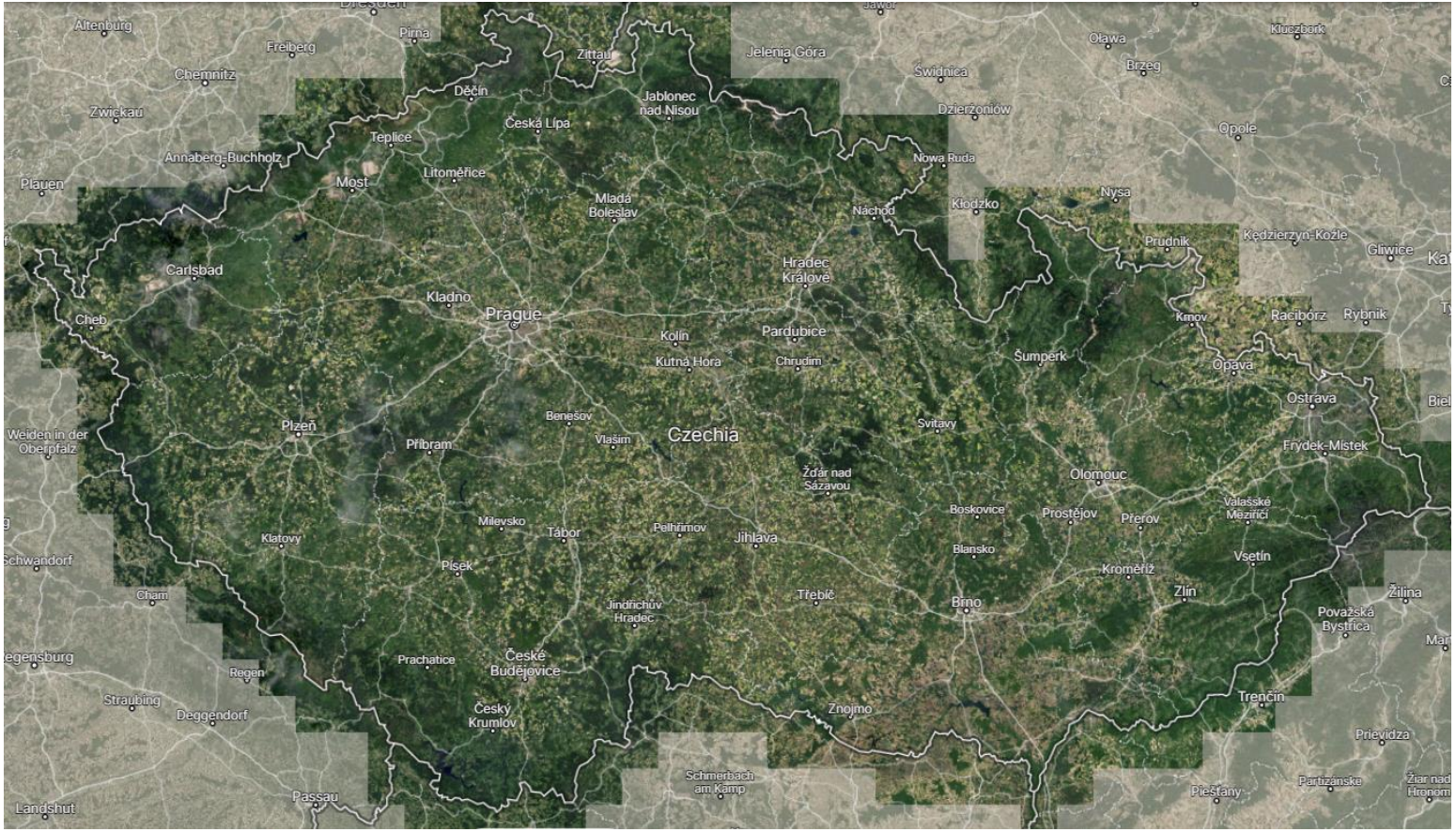


Soil Moisture - indicator for droughts:

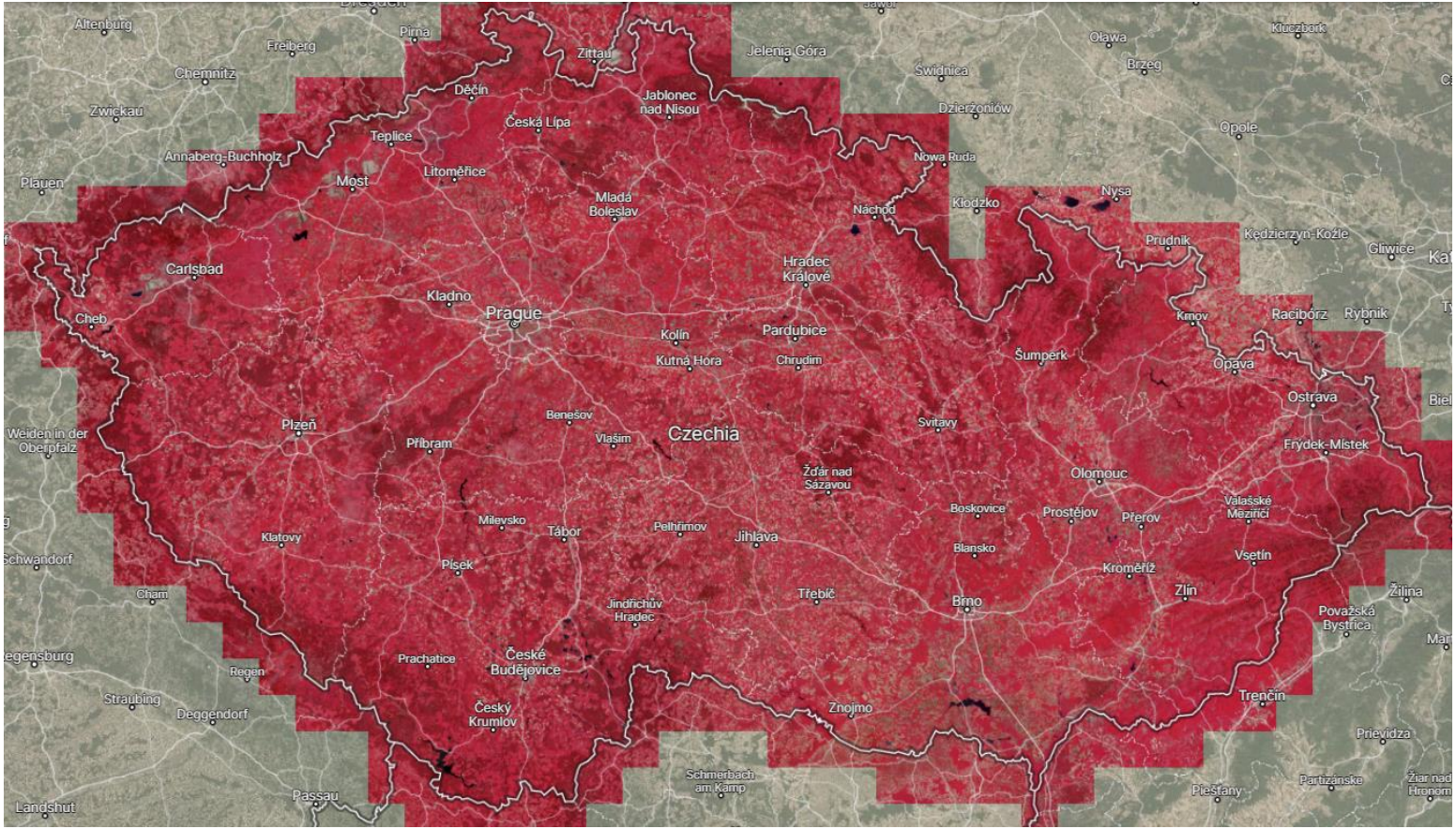
- Direct measure of how much water is available for plants
- Therefore a critical predictor for yield and wildfires
- Rainfall only provides the input of water availability; it does not account for evaporation, water runoff, and the additional water stored in the ground.


+
Planet Basemaps
AGRICULTURE • North Caucasus, Russia • June 27, 2016

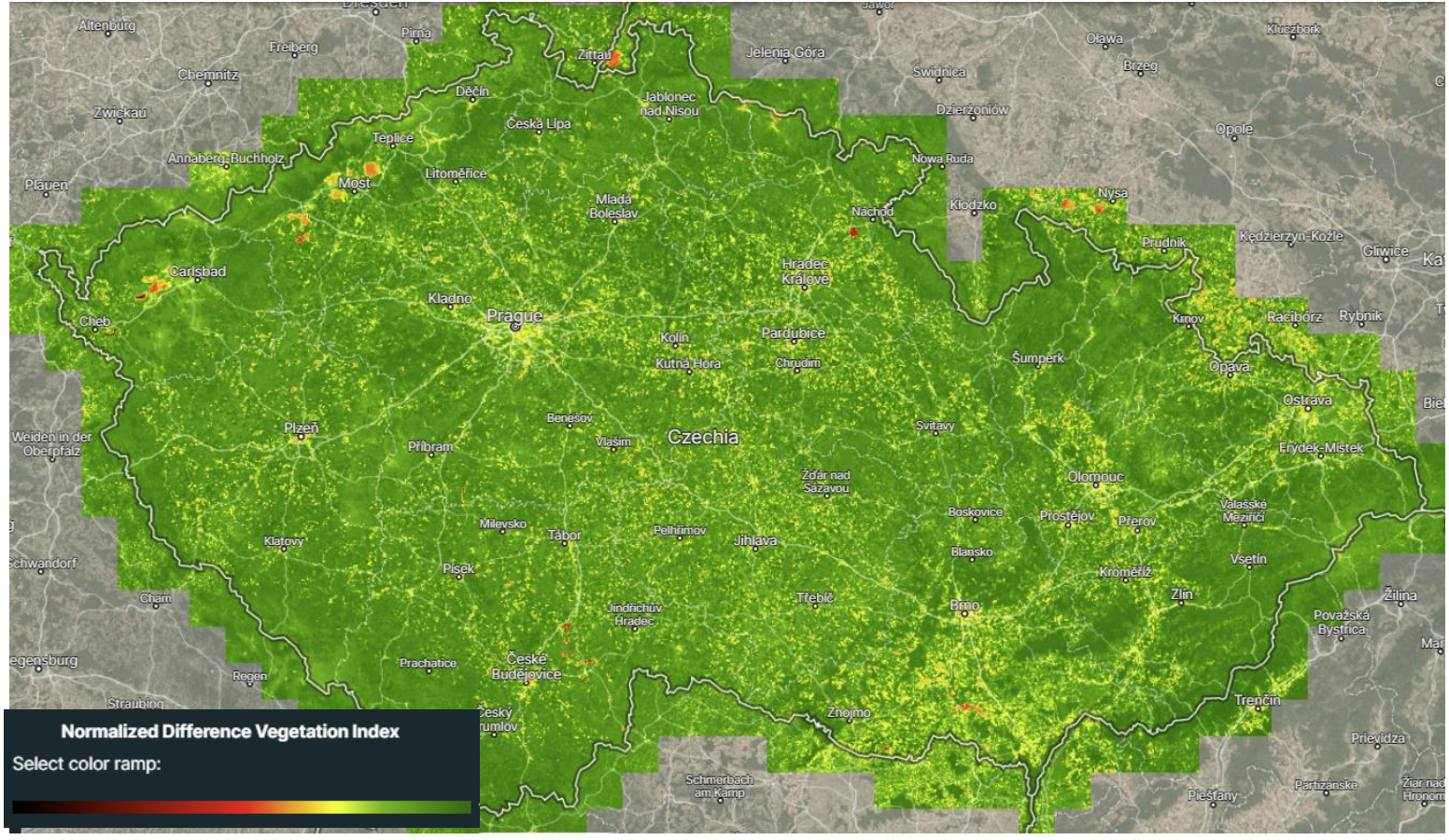
PlanetScope Basemap of Czech Republic



PlanetScope Basemap of Czech Republic



NDVI Basemap of Czech Republic



Planet + ArcGIS

PORT • Freeport, Bahamas • February 3, 2021

Integrating Planet & ArcGIS

Flexible integration options to support your workflows

Tile Services

Seamlessly stream OGC web services directly from Planet into your GIS applications.

ArcGIS Pro Add-in

Simply search, access, and analyze Planet's catalog of daily, global imagery directly from ArcGIS Pro.

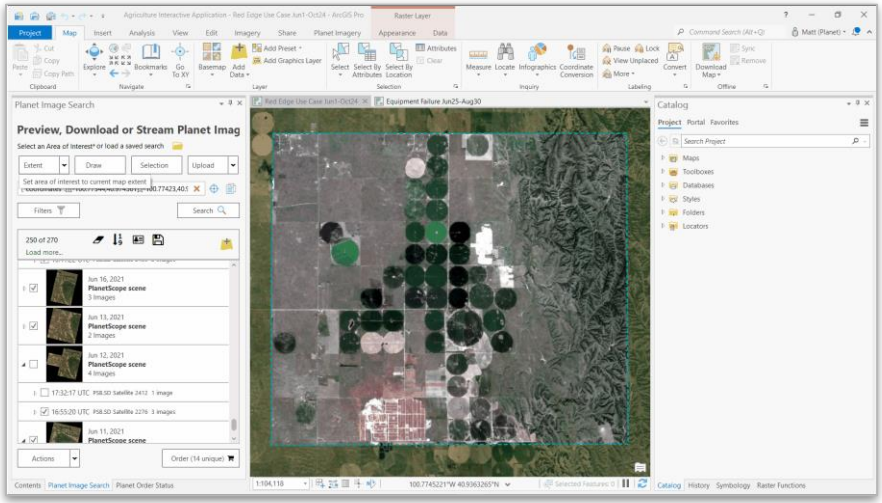
API-first Platform

Build custom integrations and data pipelines to power any earth observation solution built on ArcGIS.

Planet Add-in for ArcGIS Pro

Rapidly access Planet imagery, directly in the tools you know

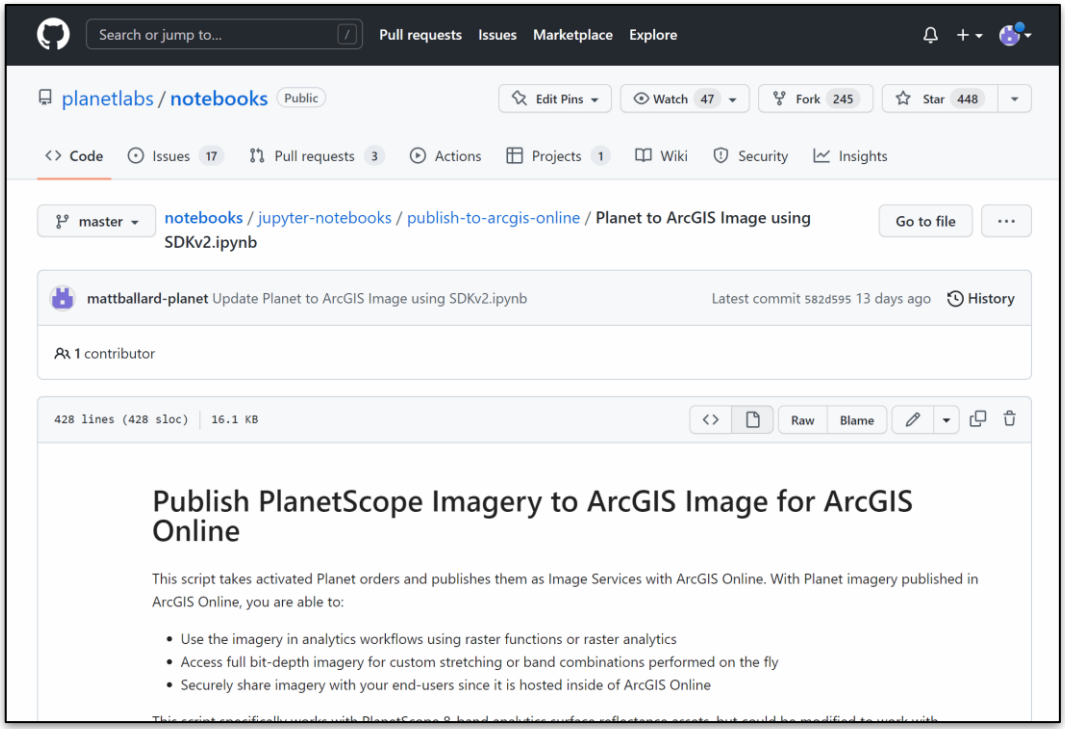
- **Search and Discover** Imagery
- Place and Download **Orders**
- Access and Stream **Planet Basemaps**
- Create SkySat **Tasking Orders**
- **Analyze and Share** Imagery by Leveraging the Power of ArcGIS Image



https://developers.planet.com/docs/integrations/arcgis/

Automate Publishing to ArcGIS Image

Sample Jupyter Notebooks



go.planet.com/arcgis-git

The Future of Planet

CAPE TOWN · South Africa · September 8, 2021

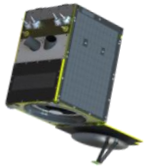
Hyperspectral Acts as a Force Multiplier

High spectral and radiometric resolution measurements augment Planet's solutions

SuperDove

Always-on Monitoring

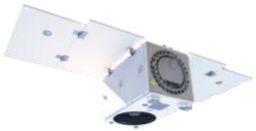
- ~180 satellites
- Up to 300 million km^2 / day
- 8-band
- Unique scanning



SkySat

High-Resolution Tasking

- 21 satellites
- 50cm resolution
- RGB, NIR, and Pan bands
- Sub-daily tasking



Pelican

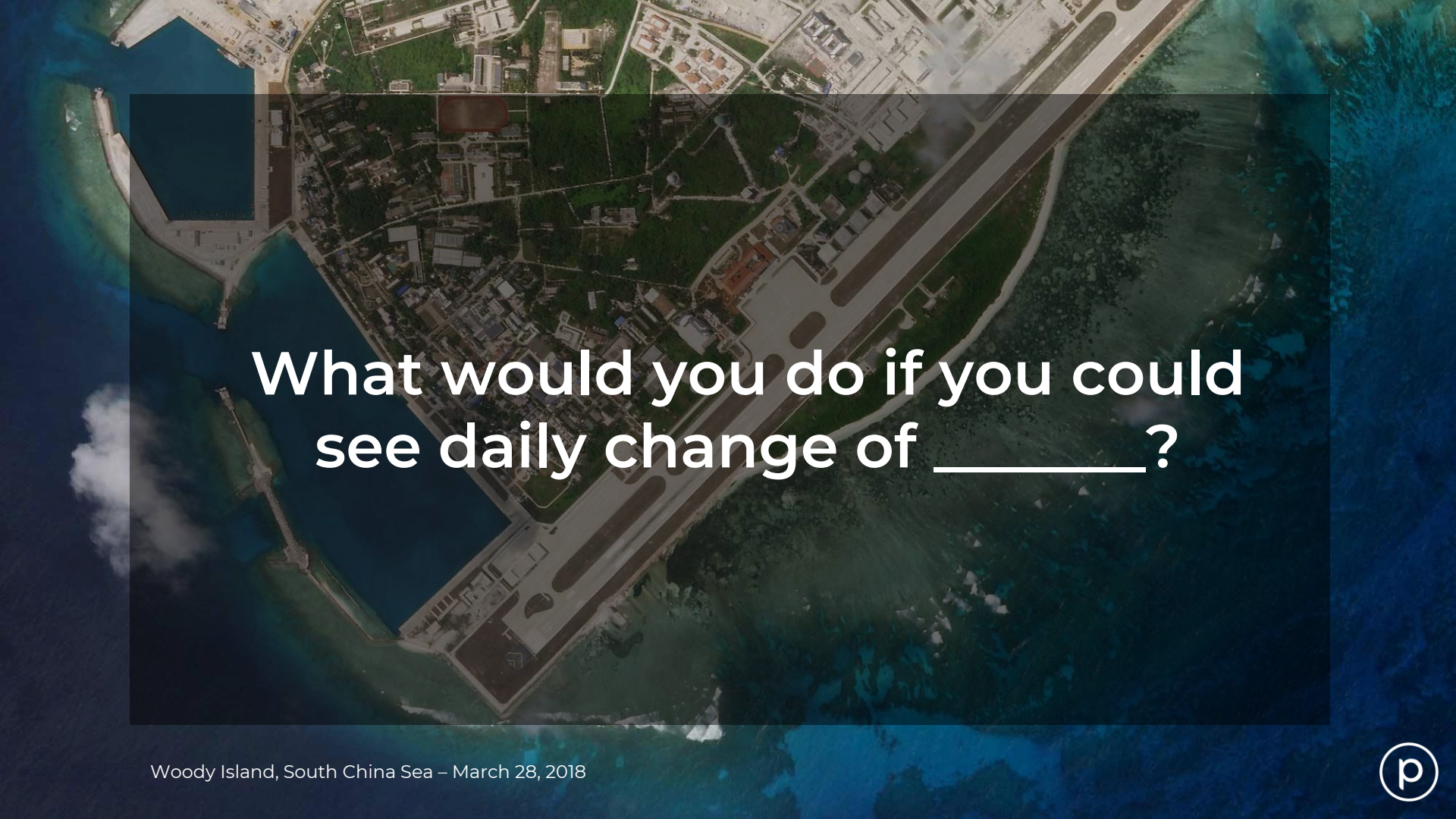
Very High Resolution Tasking

- Initial fleet of up to 30 satellites[1]
- 30cm resolution
- Pan + 6 RGB+NIR bands
- Up to 30 revisits/day

Tanager

Hyperspectral Tasking

- 400 - 2500 nm
- ~400 5nm bands
- 30m resolution
- Technical demo planned to launch late 2023



Woody Island, South China Sea – March 28, 2018

Thank You.

Visit our booth and discuss how Planet can help you

Register to receive the full presentation directly in your inbox.

Dr. Erik Zillmann
Senior Presales Engineer
erik.zillmann@planet.com

Nikola Strah
Sales Manager
Central & Eastern Europe
nikola@planet.com

planet.