



# Harnessing The Power Of Satellite Imagery For Climate Action



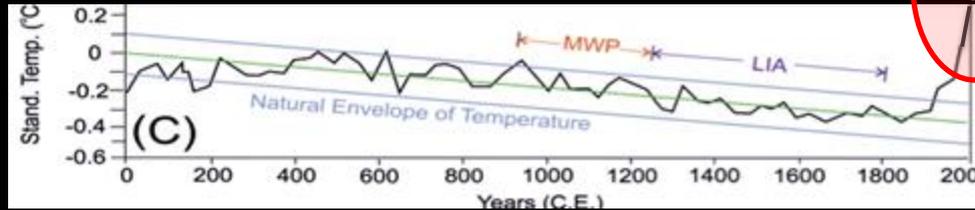
Pooja Pandey, Planet

Open Data Knowledge Workshop 2023

GLEN CANYON DAM • Page, Arizona, USA • August 14, 2021

# + An Earth System Perspective

Temperature rise:  
170 times faster than the background rate of change!



Human  
Influence

Summerhayes 2015

# + Earth is Changing Fast

Vertebrate  
species loss  
since **1900**

is **22x** higher than  
baseline figures.

Science Advances Journal

By **2030** we need to  
increase food  
production by **60%**

and **2/3 s** of the population will  
experience water scarcity

Food and Agriculture Org.

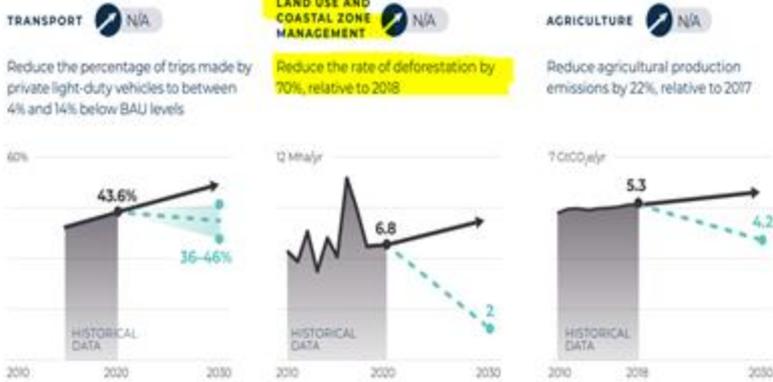


# Why is this important? If we take stock of progress toward 2030

targets

- We are missing data

**Q WRONG DIRECTION:** Change is heading in the wrong direction, and a U-turn is needed



**? INSUFFICIENT DATA:** Data are insufficient to assess the gap in action required for 2030





# Using Data to Drive the Sustainable Development Goals





# Earth Observation Data for SDG Monitoring

- Monitoring SDG's is **data intensive**
- Generating data for SDG monitoring through the traditional surveys and censuses is **very expensive** (cost up to **\$253 billion globally** during the lifetime of the SDGs - FAO)
- Depending on the type of indicator, EO data and Geospatial analysis can be used for one or a combination of the following:
  - **Direct measurement**, or contribution to direct measurement (Area statistics, Pixel counting, Image classification)
  - **Disaggregation** (dissymmetric mapping, modelling)
  - **Support agricultural survey sample design**, including AGRIS (Stratification, Area frame)



# How Planet Drives Sustainability



**Measuring and  
Monitoring Social  
and Environmental  
Change**

→ **making environmental  
Impacts visible**



**Enabling  
Sustainable,  
Inclusive and  
Efficient Operations**

→ **enabling sustainable  
supply chains**



**Improving  
Transparency  
and Reporting**

→ **aligning capital  
and climate**



# Planet's Constellation Largest Satellite Fleet

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

**~180**

Dove Satellites

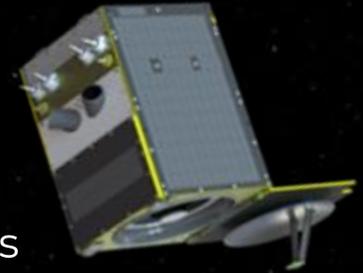


## Always-on, Broad Area Monitoring

- 3.0/4.0 meter resolution
- Daily imagery collection, no tasking required
- 8 Bands
- Red-Edge band (SuperDoves)
- Archive back to 2014

**21**

SkySat Satellites



## Rapid Revisit, Targeted Monitoring

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





# High Revisit, High Res Data

Meet Pelican



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

RESPONSIVE • RAPID REVISIT • HIGHLY PRECISE • INTEROPERABLE

EXPANSIVE  
COVERAGE

UP TO

**30**

satellites<sup>1</sup>

GREATER  
PRECISION

**30**

cm  
resolution

MORE  
CAPTURES

UP TO

**30**

captures  
per day

HIGHER DAILY  
REVISITS

Approximately

**30**

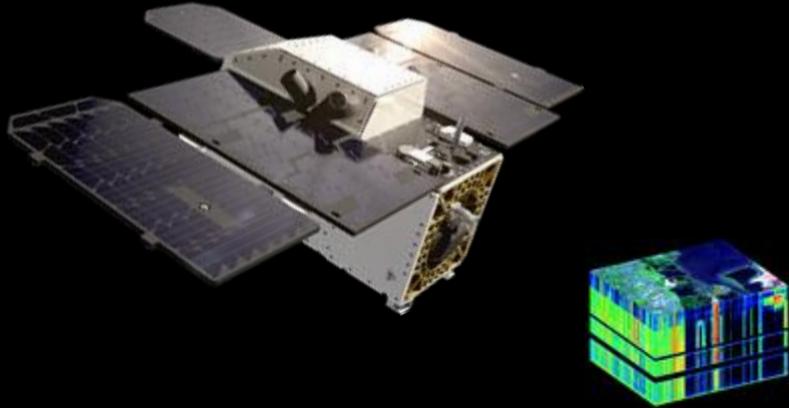
minute  
revisit time





# High Precision Hyperspectral Data

Brought to you by Tanager



Hyperspectral imaging captures the unseen, revealing valuable information that enables improved modeling, reduced uncertainty, and better, more efficient decision making.



- CROP DIFFERENTIATION • BIODIVERSITY TRACKING
- METHANE MONITORING • MATERIALS IDENTIFICATION
- ENVIRONMENTAL SITE ASSESSMENT
- SOIL CHARACTERISTICS • AND MANY MORE



# Part of the Carbon Mapper Coalition



- Non-profit (501c3) entity
- Incubates public-private partnership
- Manages the global open data portal
- Leads research, outreach and advocacy efforts for Methane/CO<sub>2</sub> mitigation



**HIGHTIDE**  
FOUNDATION

**Bloomberg Philanthropies**

**Grantham Foundation**  
for the Protection of the Environment

PHILANTHROPY

**CALIFORNIA**  
AIR RESOURCES BOARD

**RMI**  
ENERGY TRANSFORMED.

REGULATORY

**planet.**

- Commercial data provider
- Engineering innovation
- Spacecraft & operations provider

**JPL**  
Jet Propulsion Laboratory

- Hyperspectral Payload provider
- Transfers knowhow and expertise

TECHNOLOGY

**ASU**

SCIENCE





# A New Approach

Planet provides geospatial data at the speed of change, equipping users with the data necessary for making informed, timely decisions.



## High Frequency, Global Coverage

Monitor your world with the most up-to-date, global satellite data, captured daily.



## Analysis Ready Data

Focus your investments on solving core problems with clean, consistent, and harmonized data.



## Modern APIs & Cloud Architecture

Build applications and scale transformative insights across your organization.



## GLOBAL LANDSCAPE

# Two Multi-Trillion Dollar Global Economic Shifts

**\$100 T**

Cumulative value  
created by 2025<sup>1</sup>

## DIGITAL TRANSFORMATION

Big Data & AI are unleashing a significant opportunity across industry; from Agriculture to Transportation to Forestry to Government, Planet delivers the data needed to create digital efficiencies and reduce cost.



**\$53 T**

Global ESG  
assets by 2025<sup>2</sup>

## SUSTAINABILITY TRANSFORMATION

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

<sup>1</sup> World Economic Forum – Digital Transformation Initiative. Estimate of value that digitalization could create over the next decade.  
<sup>2</sup> Bloomberg – ESG Assets May Hit \$53 Trillion by 2025



# + The ESG Reckoning is Here

## Social Responsibility

### An ESG Reckoning Is Coming

by Michael O'Leary and Warren Valdmanis

SUSTAINABLE FUTURE

### Big business likes to trumpet ESG credentials. But a 'greenwashing' reckoning could be on the horizon

PUBLISHED WED, SEP 21 2022-1:34 AM EDT | UPDATED THU, SEP 22 2022-4:29 PM EDT

Ammar Frangoul

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#### KEY POINTS

- Today, companies that give their products or services the "ESG" or "sustainable" label are finding their business practices and claims examined in great detail by lawyers, the public, environmental organizations and regulators.

ADVISOR INVESTING | ADVISOR POV

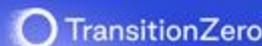
### Opinion: The ESG Label is Dead—Long live E, S, and G

MARKETS | JOURNAL REPORTS: FUNDS/ETFs

### Fund Managers Brace for Europe's New Anti-Greenwashing Rules

Rules were delayed and made less demanding after outcry





# Coal power plant emissions monitoring

## WattTime & Transition Zero

### Goals

Estimate power plant emissions globally.

Increasing temporal and spatial resolution to identify vapor plumes.

Find cloud-free scenes.

### Approach and Results

1. Incorporate PlanetScope ~3m RGB resolution.  
(a) Better distinguishing of small visible vapor plumes.
1. Daily revisit of Planet imagery improves the ability to interpolate power plant operation.  
(a) More cloud-free scenes.
1. Overall, Planet imagery has improved the performance of their machine learning models both spatially and temporally.



Paradise, USA, KY (PSScene4Band)



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • September 2010



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • September 2012



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • August 2013



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • August 2014



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • August 2015



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • September 2016



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA · August 2017



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • August 2018



+

# GLOBAL WARMING

EXIT GLACIER, ALASKA • August 2019



+

# The Allen Coral Atlas

14 LIFE  
BELOW WATER



will map all of the world's coral reefs in unprecedented detail, monitor them for change, and make the resulting data a global public good.





**SCCON** uses **PlanetScope imagery** to detect areas that have been deforested to assist Brazilian government with law enforcement.



**PARÁ, BRAZIL** • August 7-13, 2017





**PARÁ, BRAZIL** • August 14-20, 2017





**PARÁ, BRAZIL** • August 21-27, 2017





**SCCON** uses **PlanetScope imagery** to detect areas that have been deforested to assist Brazilian government with law enforcement.





GLOBAL  
FOREST  
WATCH



15 LIFE  
ON LAND



MATO GROSSO, BRAZIL · August 20, 2019



# + CARBON EMISSIONS FROM DEFORESTATION

2016

CARBON LOSS

CARBON IN 1,000 METRIC TONS

13 CLIMATE  
ACTION



# + CARBON EMISSIONS FROM DEFORESTATION

2016

CARBON LOSS

CARBON IN 1,000 METRIC TONS

JUN. 15—AUG. 13



5,856

13 CLIMATE ACTION



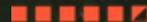
# + CARBON EMISSIONS FROM DEFORESTATION

2016

## CARBON LOSS

CARBON IN 1,000 METRIC TONS

JUN. 15—AUG. 13



5,856

AUG. 13—25



18,276

13 CLIMATE  
ACTION



# + CARBON EMISSIONS FROM DEFORESTATION

◀ 2016 ▶

## CARBON LOSS

■ CARBON IN 1,000 METRIC TONS

JUN. 15—AUG. 13



5,856

AUG. 13—25



18,276

AUG. 25—NOV. 11



105,168



# + CARBON EMISSIONS FROM DEFORESTATION

13 CLIMATE  
ACTION



◀ 2016 ▶

## CARBON LOSS

■ CARBON IN 1,000 METRIC TONS

JUN. 15—AUG. 13



5,856

AUG. 13—25



18,276

AUG. 25—NOV. 11



105,168

NOV. 11—DEC. 22



10,144



# + SILT PLUME STREAMING FROM GREENLAND GLACIER

13 CLIMATE  
ACTION



SCORESBY SOUND, GREENLAND • Sept 29, 2018





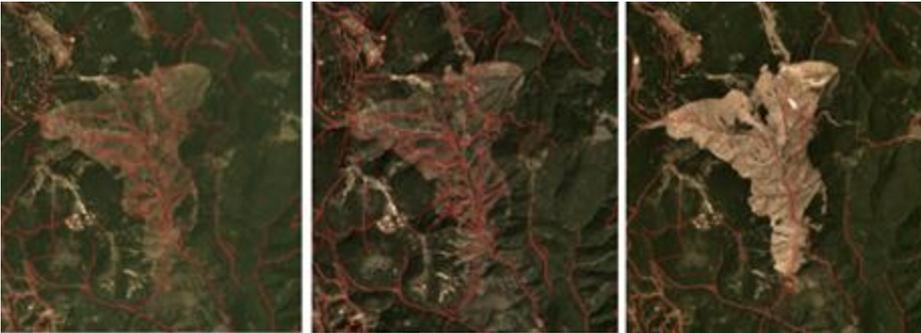
# Road Construction As Early Indicator of Deforestation



July-December 2017

January 2018

May 2018



June 2018

September 2018

June 2019

“Roads are often a precursor to further deforestation, so being able to quickly and reliably detect new roads across the tropics would be a game-changer for identifying high risk areas.”

MIKAELA WEISS

Global Forest Watch Manager



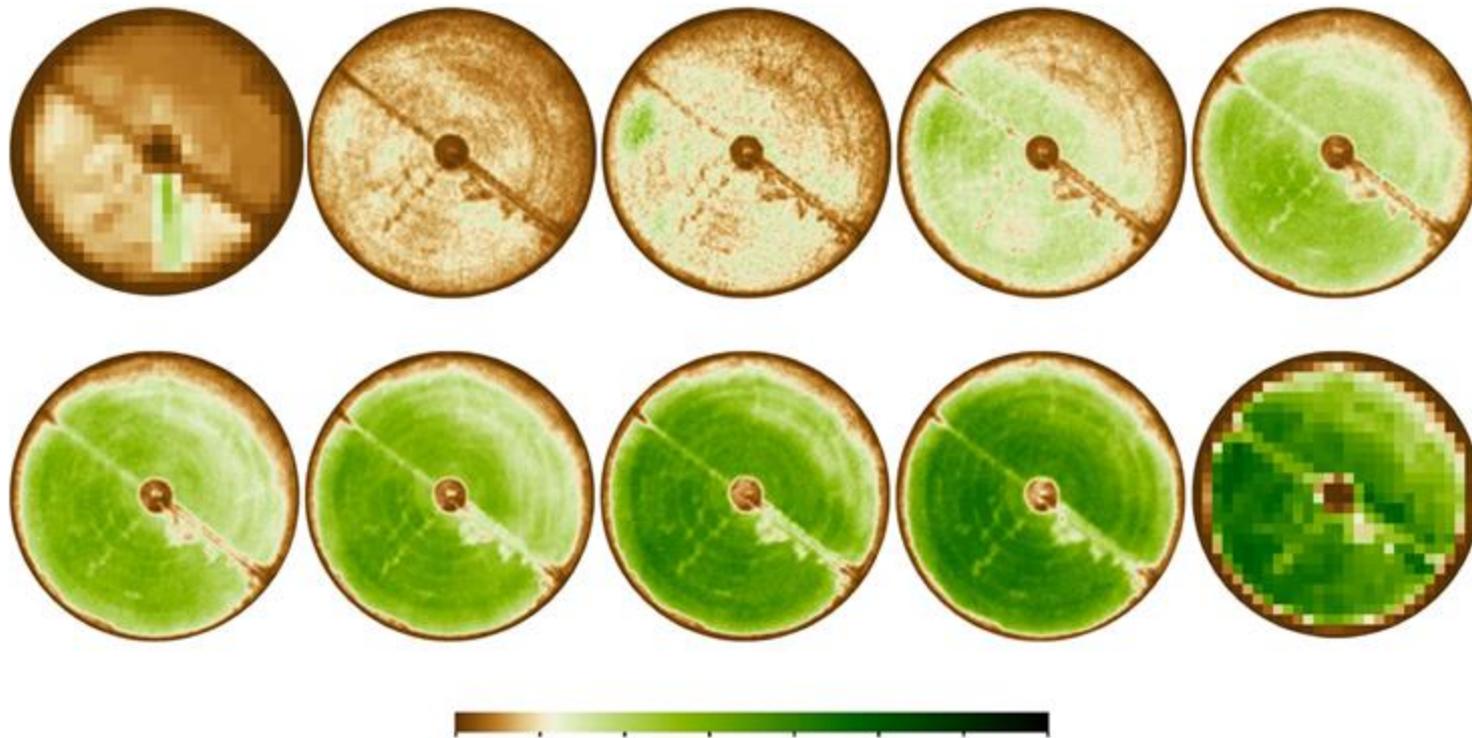
**GLOBAL  
FOREST  
WATCH**

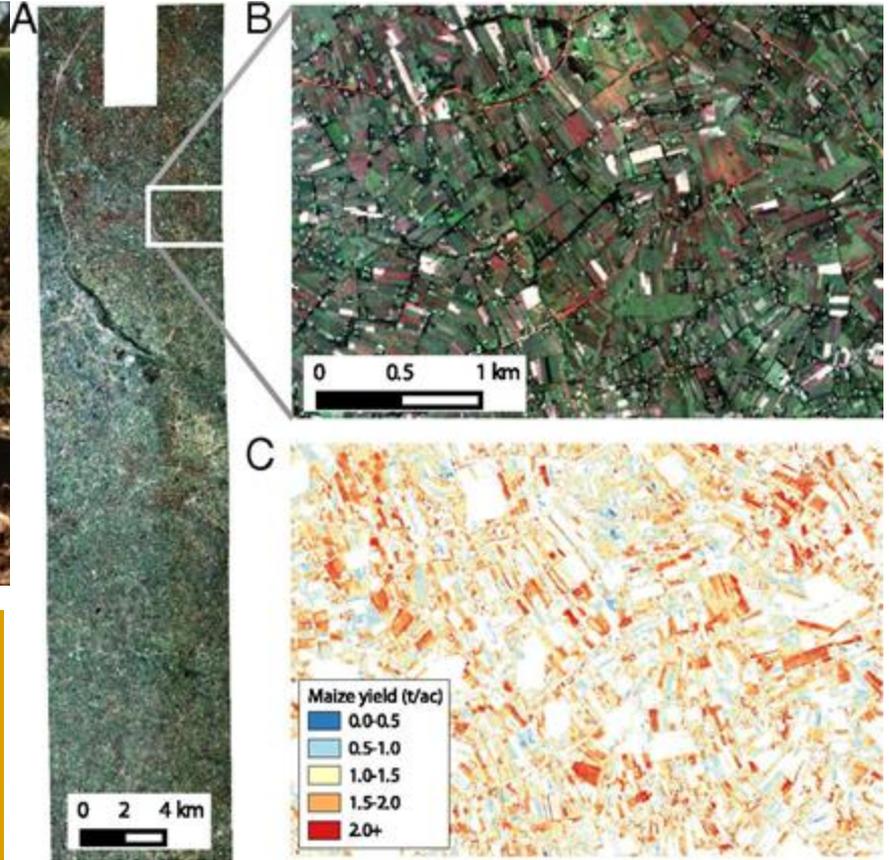
**15** LIFE  
ON LAND





# Daily Measurements Of Crop Health





# + Pakistan Flood Assessment



- The climate change minister says **more than a third of the country** has been completely submerged by the heaviest recorded monsoon rains in a decade.
- About **170,000-sq km** of area in Pakistan, which is already reeling under rising food prices, is reportedly submerged, out of which **78,000 square km area of crops cultivated across 57 districts are underwater**.
- Recent estimates show that roughly **65 per cent of the country's food basket** — particularly crops like rice, cotton, wheat and onion — have been washed away.

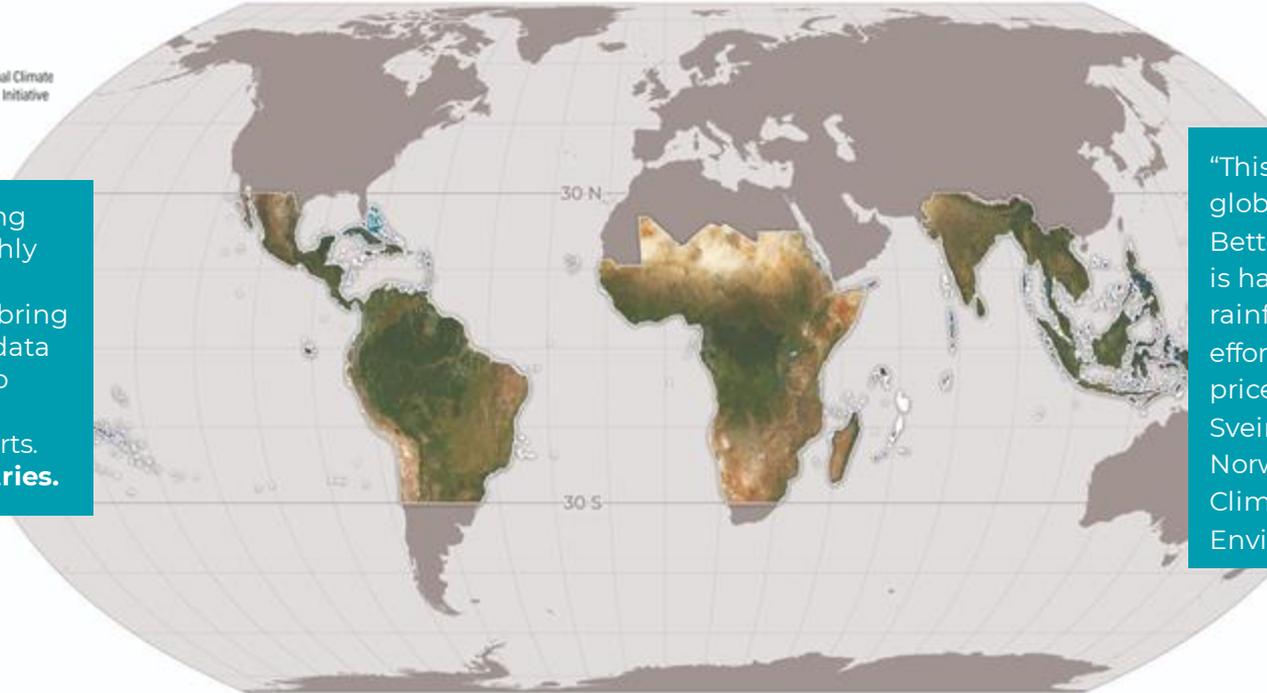




# Monitoring Deforestation of the Tropics with Norway



**Planet** is providing **NICFI** with monthly basemaps of the global tropics to bring unprecedented data & transparency to global climate & conservation efforts. **Covers 64 countries.**



“This will revolutionize global forest monitoring. Better insight into what is happening in the rainforests will enhance efforts to protect these priceless ecosystems”, - Sveinung Rotevatn, Norway’s Minister of Climate and Environment.

Global map showing the extent of monthly Planet Basemaps to be provided through the partnership for tropical forest monitoring.





# Impact of the Program

**>300**

USER STORIES  
COLLECTED

**130** countries

REGISTERED TO USE  
THE PROGRAM

**25%** increase

OF USAGE OF NICFI DATA ON  
GFW Q1 – Q2 2021

**63%**

OF TOTAL BASEMAP SELECTIONS ON  
GFW FOR FIRST 6 MONTHS OF THE  
PROGRAM WERE THE NICFI  
BASEMAPS

**70%**

OF USERS SURVEYED USE  
NICFI DATA AS THEIR  
PRIMARY IMAGE SOURCE

**97** countries

INCLUDED IN THE  
PROGRAM

**11**

JOURNAL ARTICLES IN  
PEER REVIEW PROCESS

**15.1** million

TILES STREAMED FROM  
PLANET EXPLORER

**9,000**

USERS REGISTERED

+

# DEFORESTATION

15 LIFE ON LAND



SUMATRA, INDONESIA · July 2017



+

# DEFORESTATION

15 LIFE ON LAND



SUMATRA, INDONESIA · July 2017



+

# DEFORESTATION

15 LIFE ON LAND



SUMATRA, INDONESIA · August 2019





# Thank you.



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