

# AI for Earth



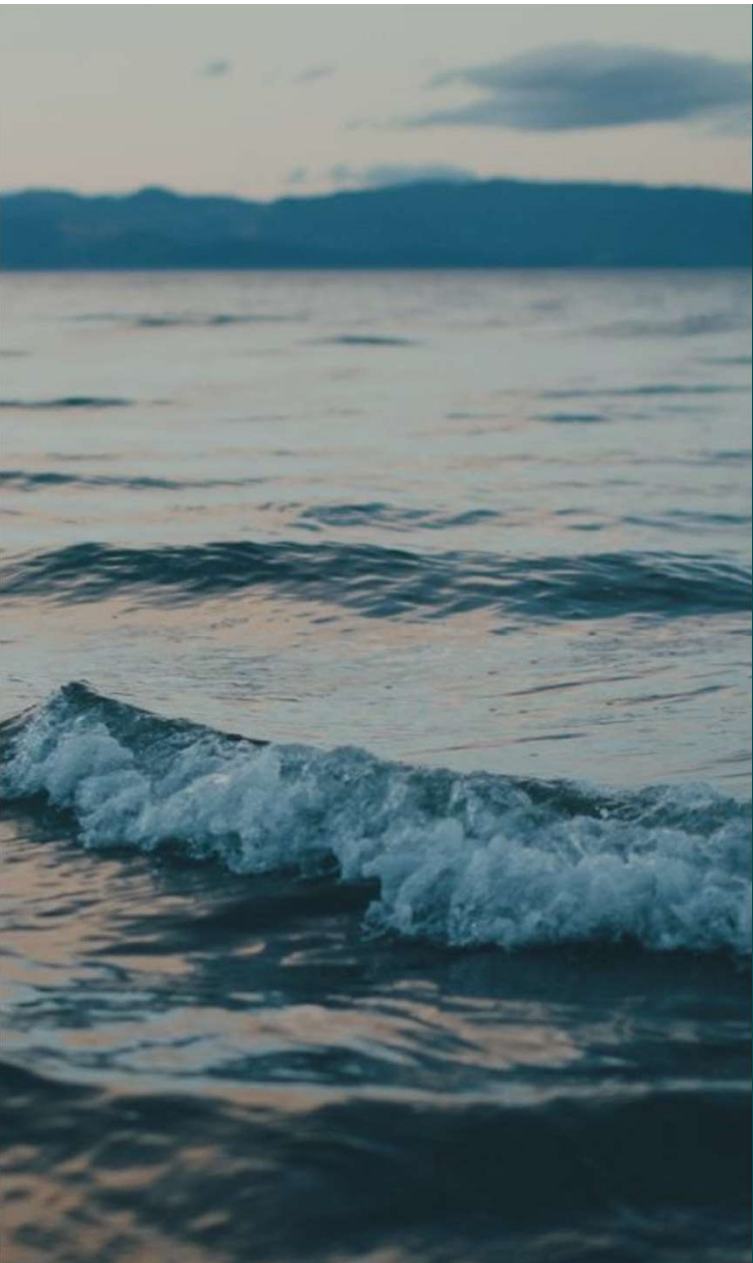


Humans face unprecedented challenges, from mitigating climate change and ensuring resilient water supplies, to feeding a growing population and stemming a catastrophic loss of biodiversity.

Solutions are difficult to find because when it comes to our understanding of the natural world, we are in an information drought.

**AI can help us chart a better future.**



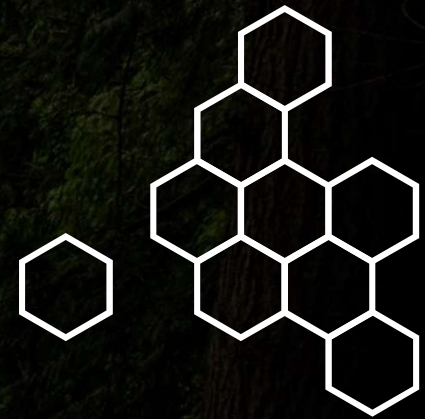


"AI can accelerate our ability to observe environmental systems and how they are changing at a global scale, convert the data into useful information, and apply that information to take concrete steps to better manage our natural resources."

**Brad Smith,  
Microsoft President**



# What is AI for Earth?





# AI for Earth

Empowering people and organizations  
to solve global environmental challenges  
through technological innovation



# Focus areas

AI for Earth is focused on four areas that are vital in building a sustainable future:



Feed the growing  
world population



Conserve and  
protect water sources



Monitor and protect  
species from extinction



Reduce climate change  
impact on communities



# Pillars of the program



Increase access



Provide education



Fuel innovation



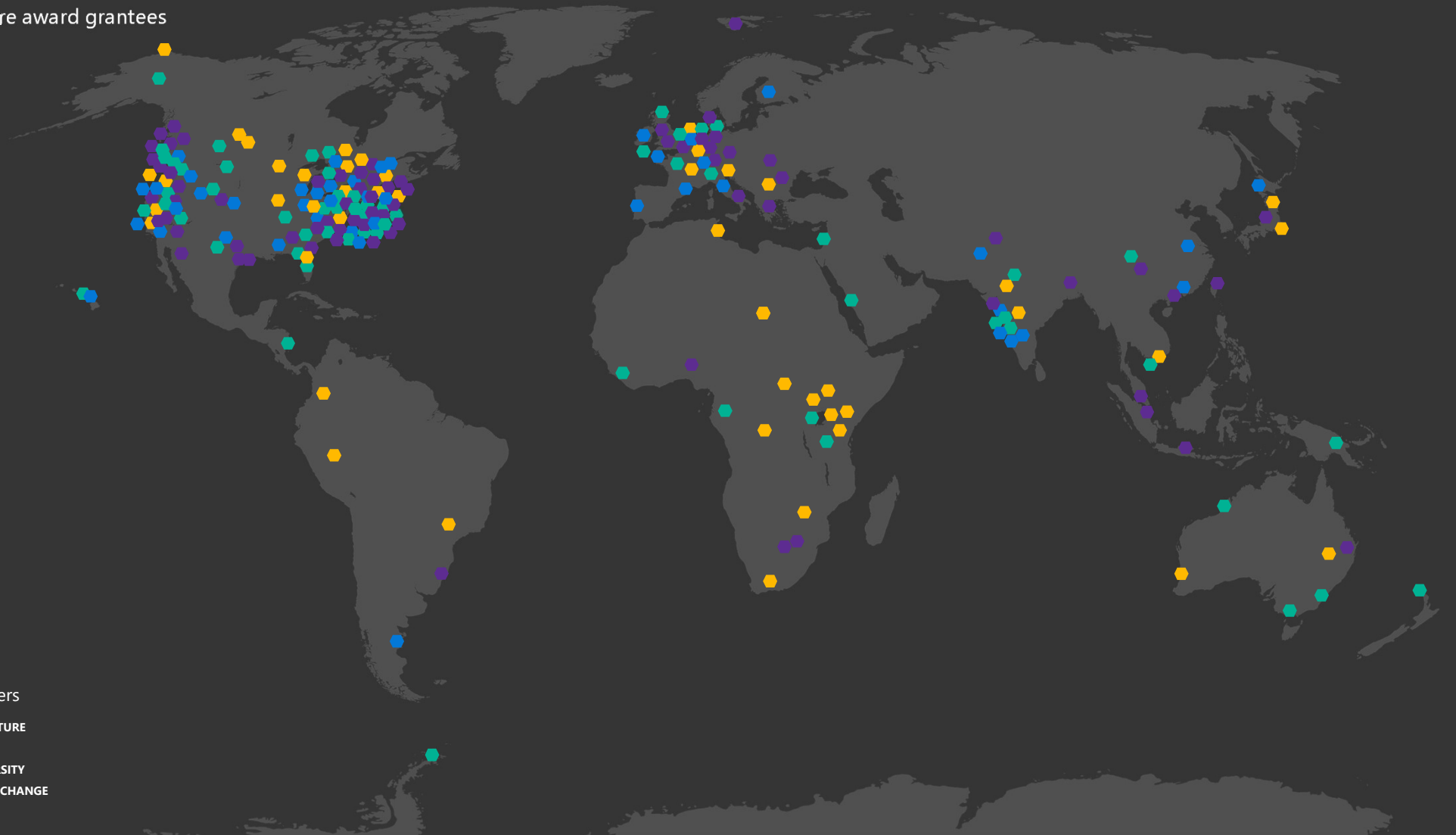
# AI for Earth

Azure award grantees



## Headquarters

- AGRICULTURE
- WATER
- BIODIVERSITY
- CLIMATE CHANGE





# Education opportunities for grantees



## AI for Earth community

Access to AI for Earth team and fellow grantees

Ask questions and collaborate with other grantees



## Office hours

A Skype for Business meeting held once a month

Purpose is to answer any questions grantees may have (Azure, ML, training)



## AI for Earth Summit

Held twice a year in Redmond, WA

Opportunity to learn, network, and participate in AI for Earth hackathons



## Learning opportunities

Microsoft Azure and AI

LinkedIn Learning offer



# Featured projects





# Featured projects

## Land Cover Mapping

Advanced mapping for precision conservation

## FarmBeats

Data-driven farming to sustainably feed the world

## Wild Me

Fighting extinction with AI and citizen science

## Project Premonition

Using insects to understand and protect biodiversity

## iNaturalist

Enabling everyone to play a role in protecting biodiversity

## SilviaTerra

Transforming how people measure and monitor forests

# Land Cover Mapping



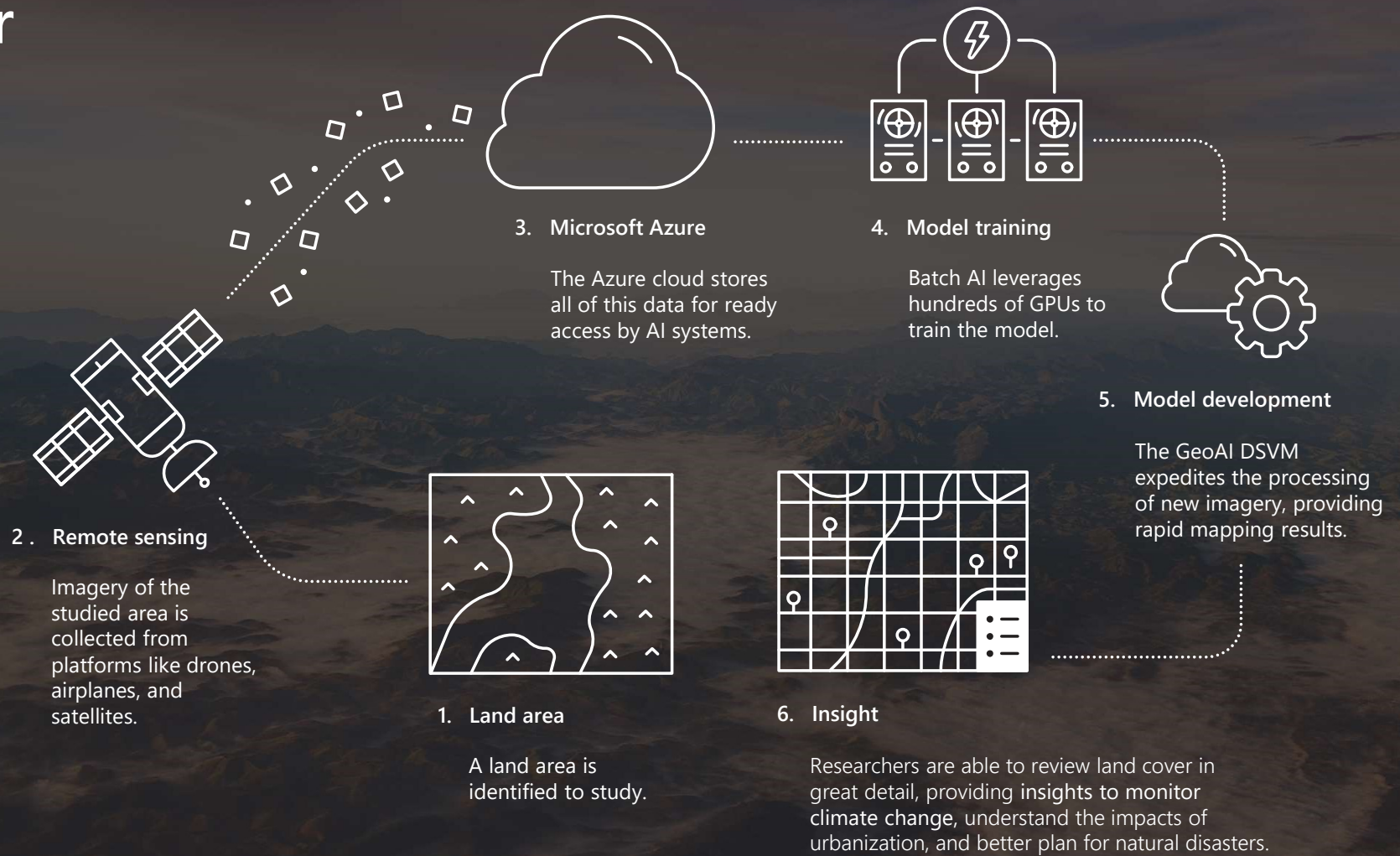
# Land Cover Mapping

Giving organizations a faster, more effective land cover mapping tool to better analyze, monitor, and manage natural resources



# Land Cover Mapping

Land cover maps help us visualize everything that covers the earth. Armed with highly accurate spatial data, conservationists can precisely track changes in the landscape over time, helping them address environmental challenges and develop climate resilient communities.





# Land Cover Mapping in action





# FarmBeats

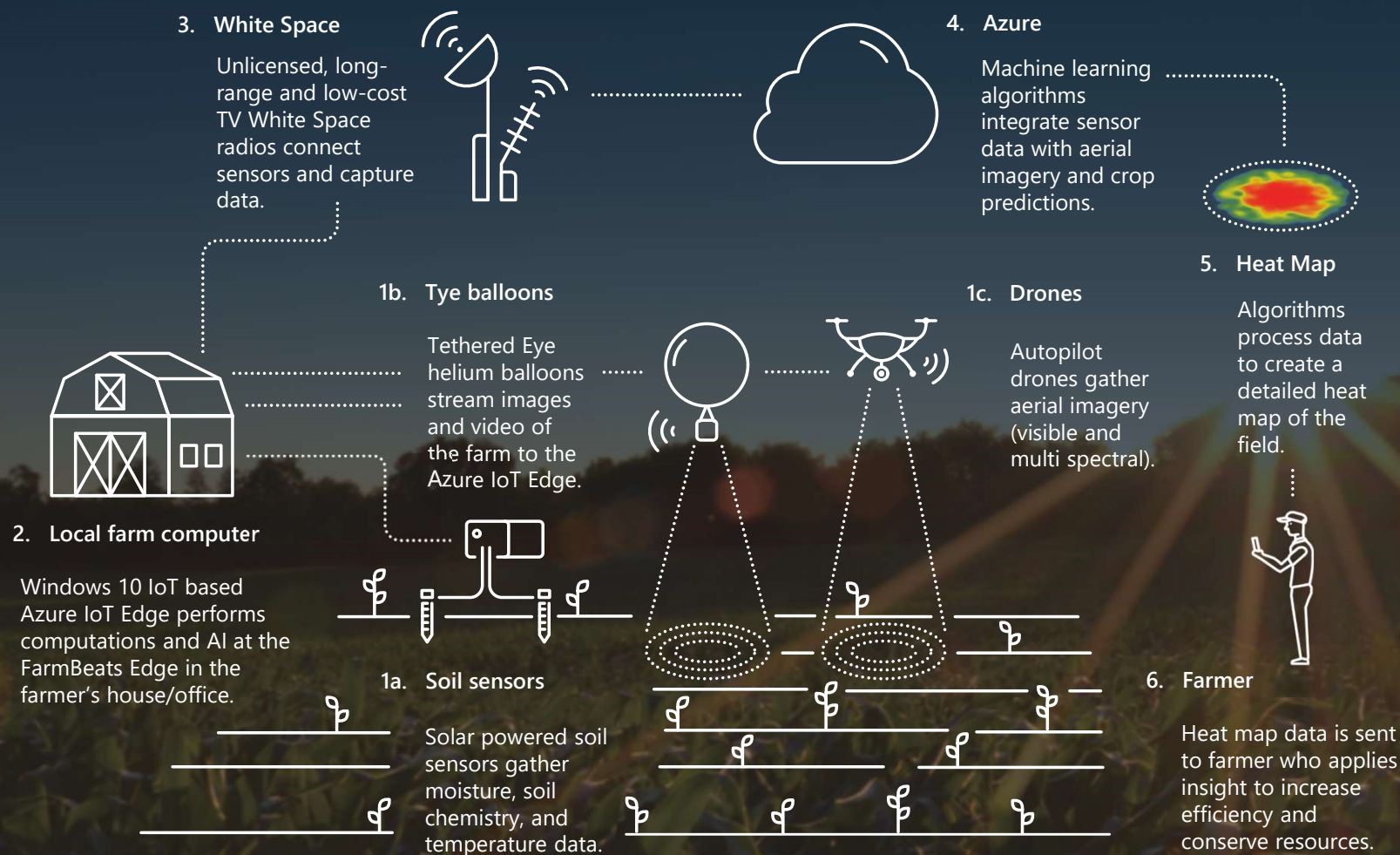


# FarmBeats

Giving farmers real-time data and actionable insights to increase production, maximize efficiency, and lower costs

# FarmBeats

FarmBeats provides farmers with access to Microsoft cloud and AI technologies, enabling data driven decisions to help improve agricultural yield, lower overall costs, and reduce the environmental impact of agricultural production.





# FarmBeats in action





# Project Premonition



# Project Premonition

Using insects as field biologists to give conservationists faster biodiversity data and insights to protect vulnerable species

# Project Premonition

Project Premonition is pairing entomology with purpose-built smart hardware and the power of Microsoft Azure to track wildlife populations, enabling organizations to quickly and accurately track biodiversity over time.

## 3. Project Premonition smart traps

Smart traps use machine learning to differentiate and sort insects by analyzing their wingbeat frequency, capturing and preserving only those that feed on the host animal being studied. The traps can also determine the insect populations without requiring capture.



## 2. Insects

Insects draw blood from animals, which contains DNA, and stores this meal in their stomachs.



## 1. Host species

Researchers identify the host animal to study and the species of insects that feed on its blood.



## 4. Laboratory

The trapped insects are taken to the laboratory, where the insect and its bloodmeal DNA are sequenced.



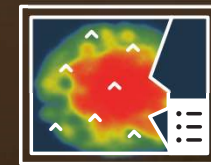
## 5. Azure

This genetic data is analyzed on the Azure cloud to provide an estimate of an ecosystem's biodiversity and the geographic distribution of the studied host animal. Azure's power and scale reduced processing time from 30 days to a few hours.



## 6. Insight

Researchers can create a heat map detailing population density of host animals and insects throughout the tested area. This can be used to track population growth as well as movement over time.





# Project Premonition in action



# iNaturalist



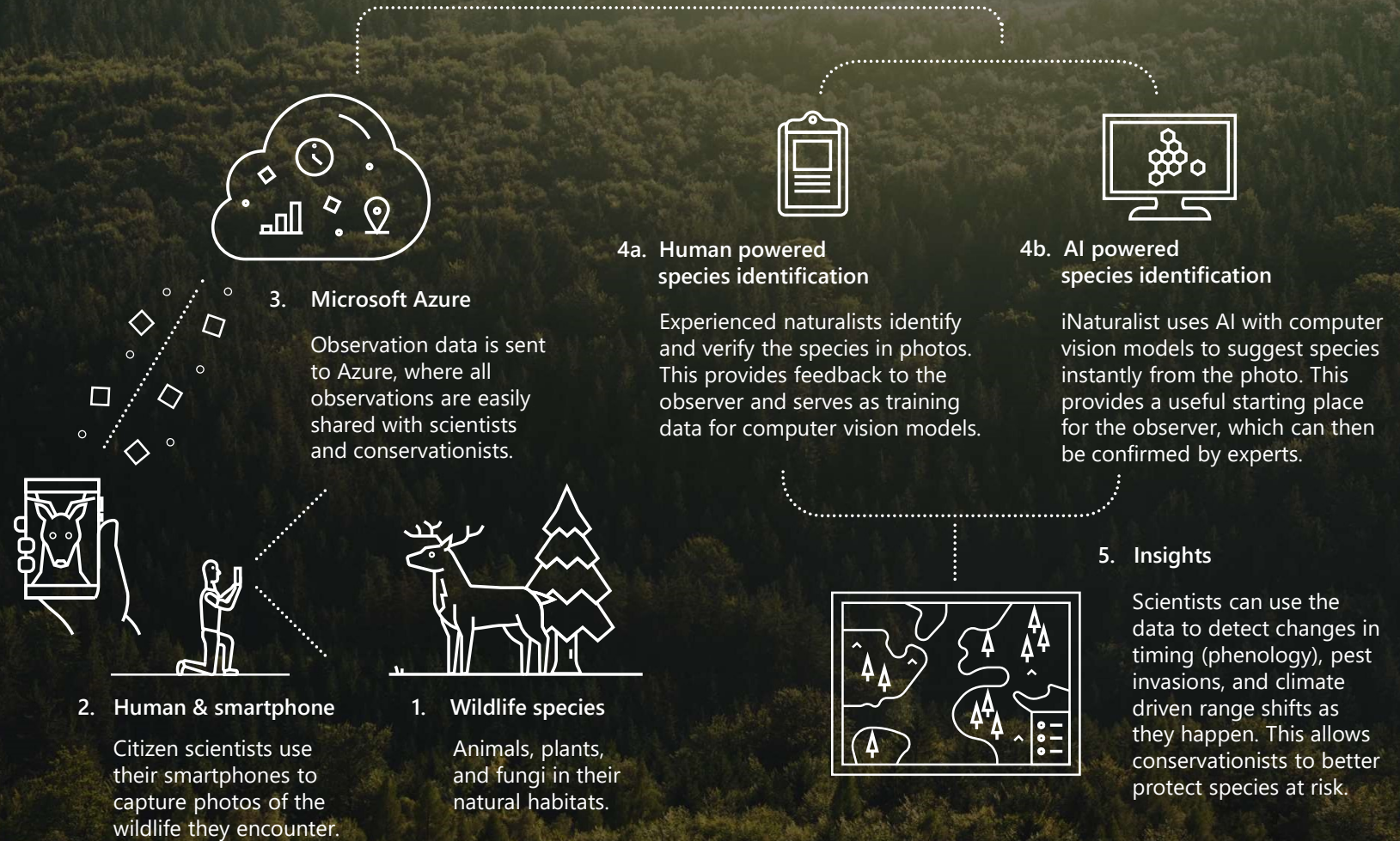
# iNaturalist

Identifying species from crowdsourced images to give conservationists real-time insights on how distributions are responding to environmental changes



# iNaturalist

iNaturalist engages a community of citizen scientists to collect data that dramatically increases our understanding of wildlife species, their behavior and distributions, and the risks posed to their survival in the future.





# SilviaTerra

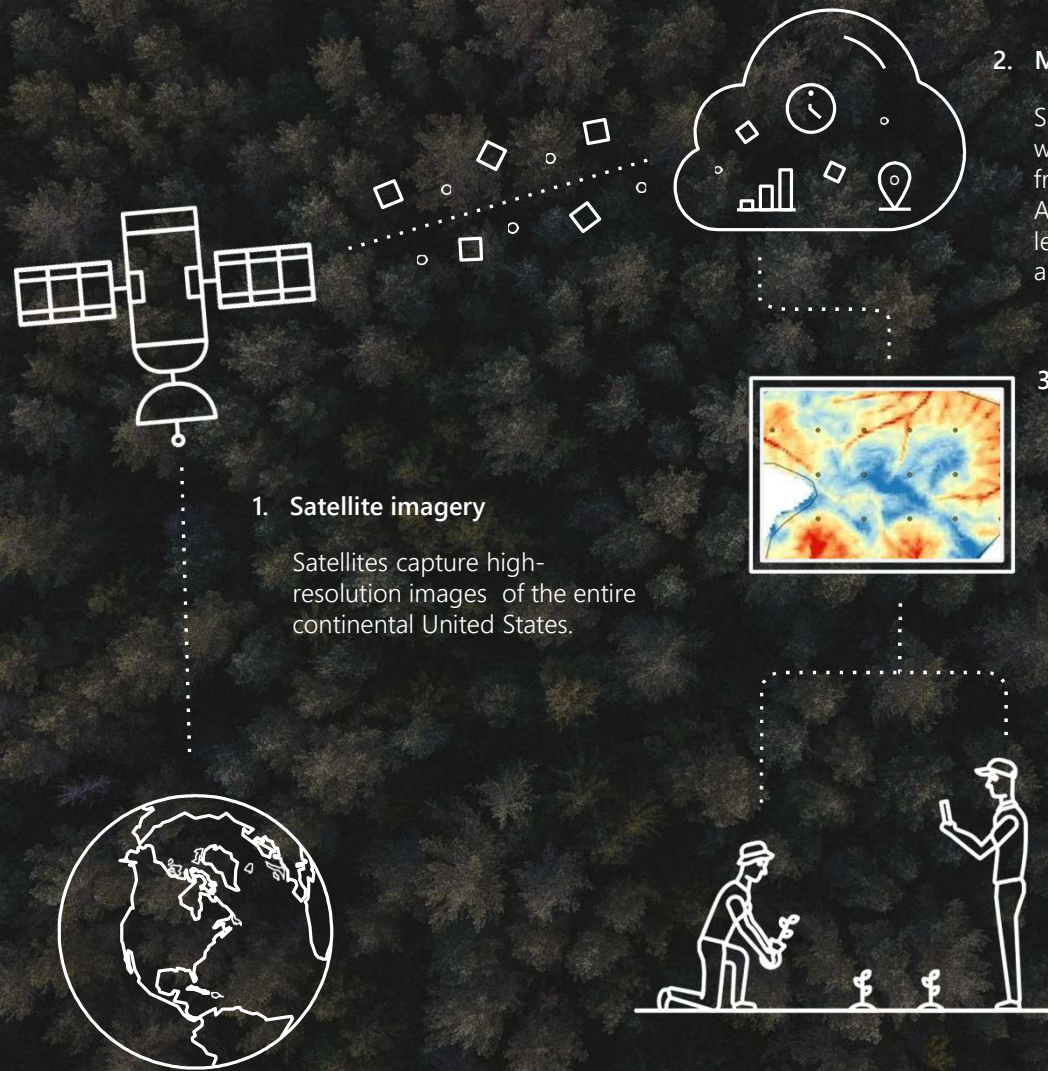
# SilviaTerra

Transforming how conservationists and landowners  
inventory forests to improve ecological, social, and  
economic health



# SilviaTerra

SilviaTerra uses cutting-edge satellite imagery and machine learning to transform how conservationists and landowners inventory forests, producing more accurate data while saving time and money.





# Wild Me



# Wild Me

Fighting extinction with citizen science and a cloud platform that uses AI to scan and identify endangered animals and species



# Wild Me

Wild Me combines citizen science and AI to combat extinction, using Microsoft Azure to enable rapid individual animal identification and population analysis while decreasing the cost of data collection.

## 4. Wildbook on Microsoft Azure

Crowdsourced images travel to the cloud, where computer vision models use pattern recognition to identify the species and individual animal.

## 3. Image upload

Images travel to the cloud, either by direct user upload or by automated crawlers that scrape social media for wildlife pictures and videos.

## 1. Animal

An individual animal with unique patterns is in the environment.

## 2. Image Capture

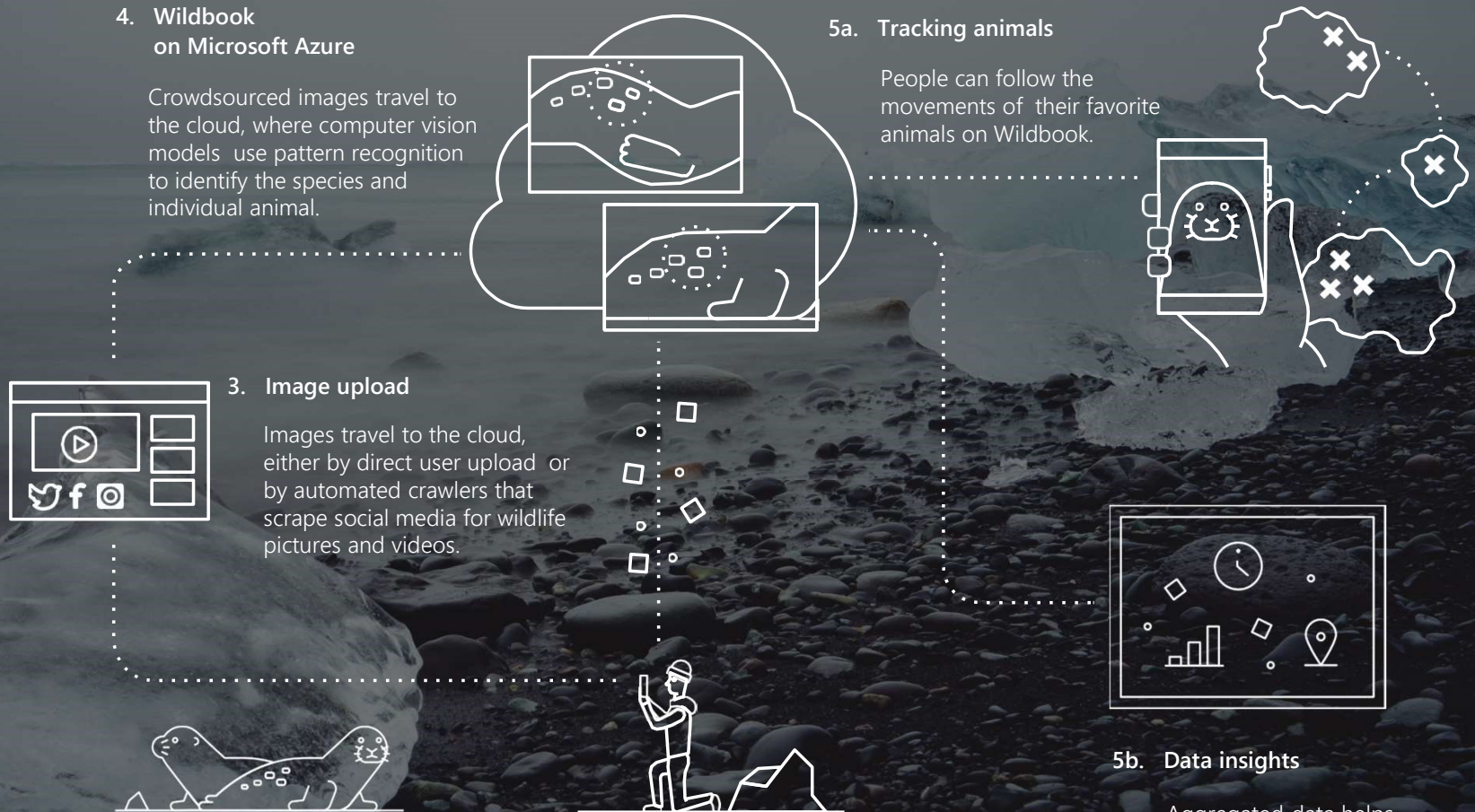
A person (scientist or citizen) photographs the animal.

## 5a. Tracking animals

People can follow the movements of their favorite animals on Wildbook.

## 5b. Data insights

Aggregated data helps scientists monitor population sizes, animal interactions, and individual movements.





# What's next for AI for Earth

As we continue to grow, our goal is simple: to put Microsoft's AI in the hands of those who need it most, driving scientific discovery and the development of innovative solutions that engage *everyone, everywhere* in protecting the planet.

**Learn more:**

[microsoft.com/aiforearth](https://microsoft.com/aiforearth)

**Apply for a grant:**

[microsoft.com/en-us/aiforearth/grants.aspx](https://microsoft.com/en-us/aiforearth/grants.aspx)

**Conservation tools:**

[gallery.azure.ai/Solution/Geo-AI-Data-Science-Virtual-Machine-2](https://gallery.azure.ai/Solution/Geo-AI-Data-Science-Virtual-Machine-2)





# Thank you