AI for Earth

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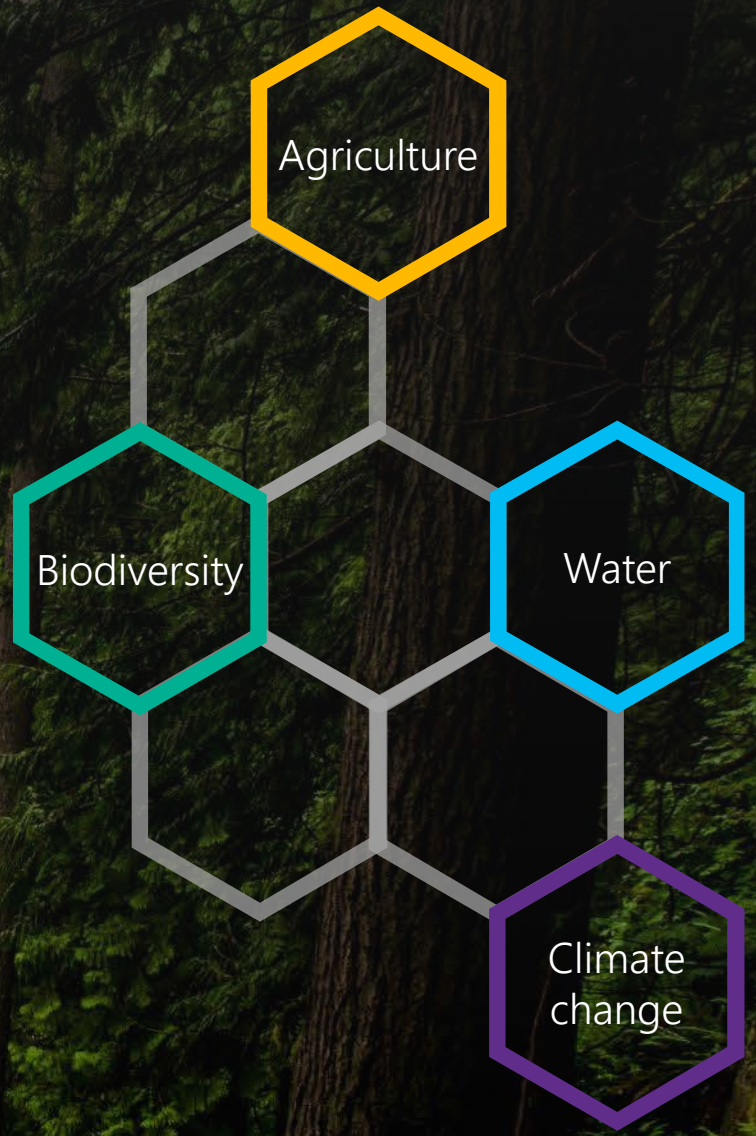
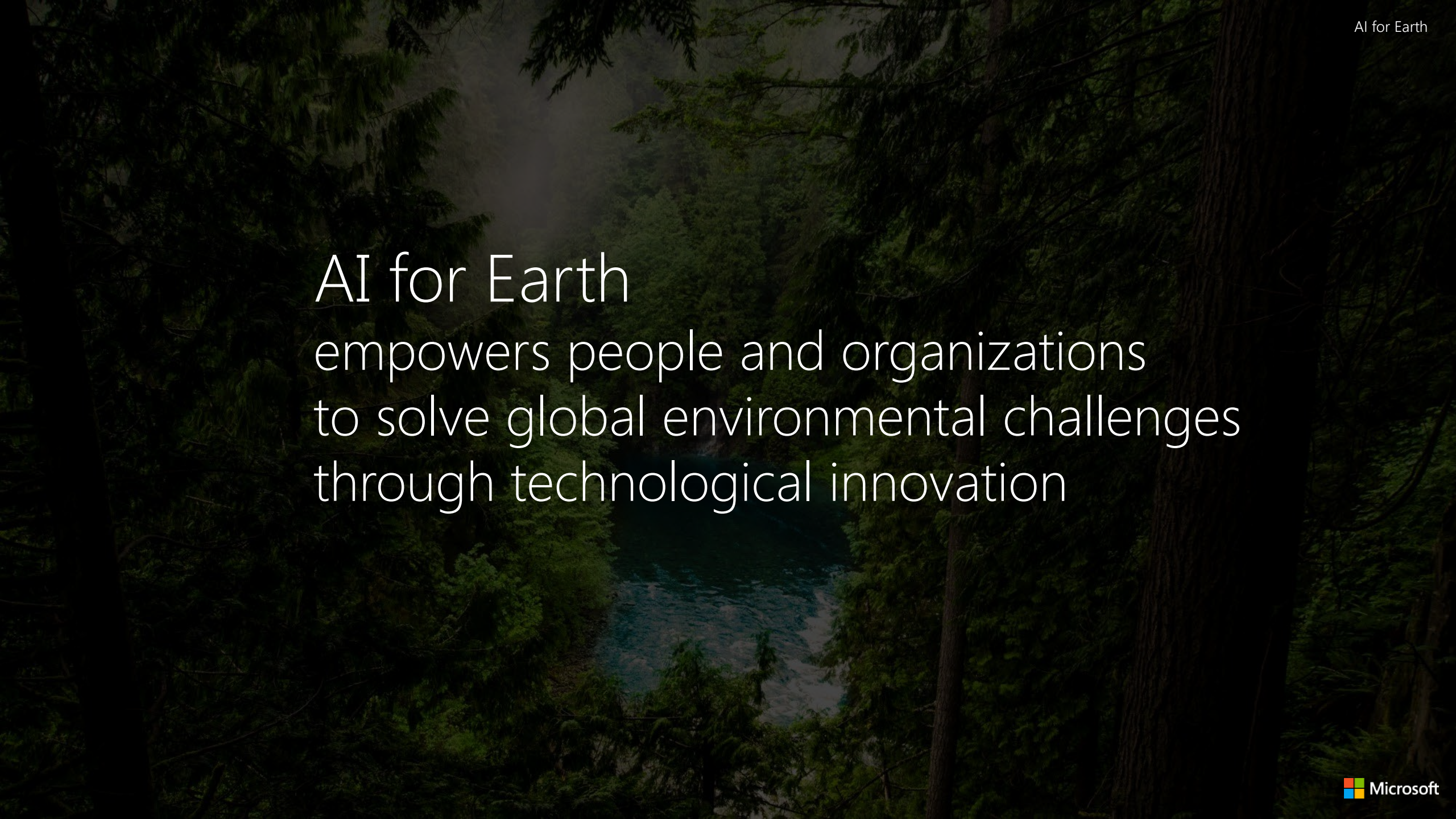


Microsoft



AI for Earth

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

Customers
and partners

Environmental
Science

AI for Earth

Monitor | Model | Manage

Computer
Science

Microsoft

Focus areas

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

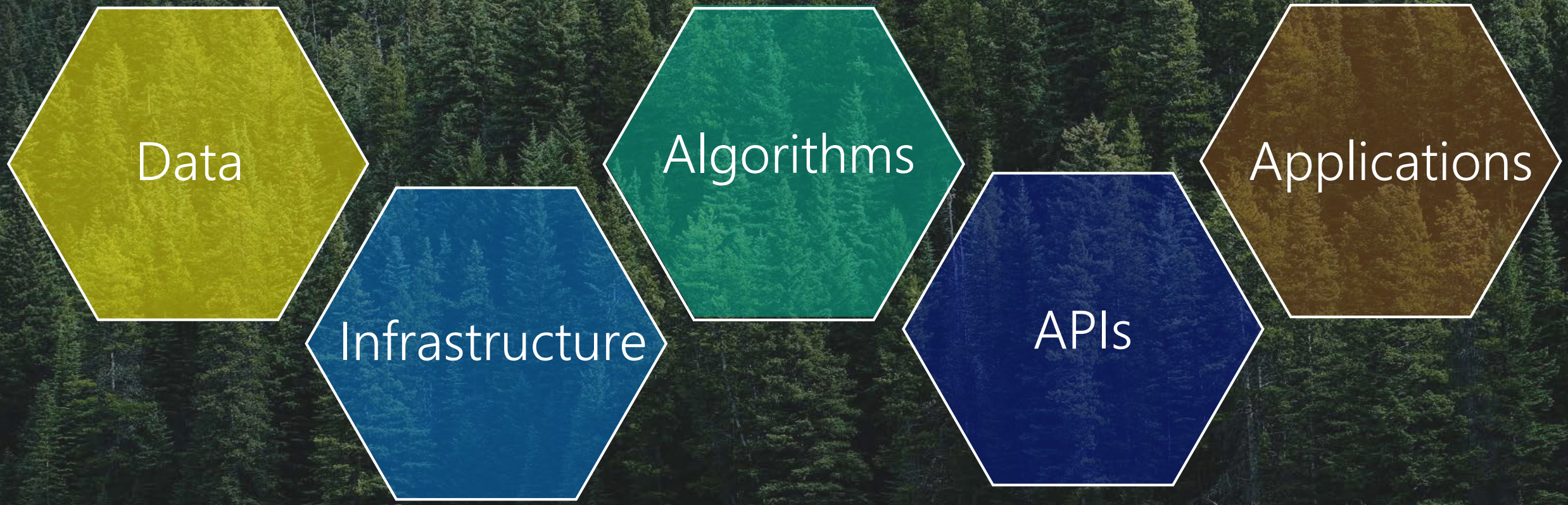
Feed the growing world population

Conserve and protect water sources

Monitor and protect species from extinction

Reduce climate change impact on communities

AI for Earth Vision



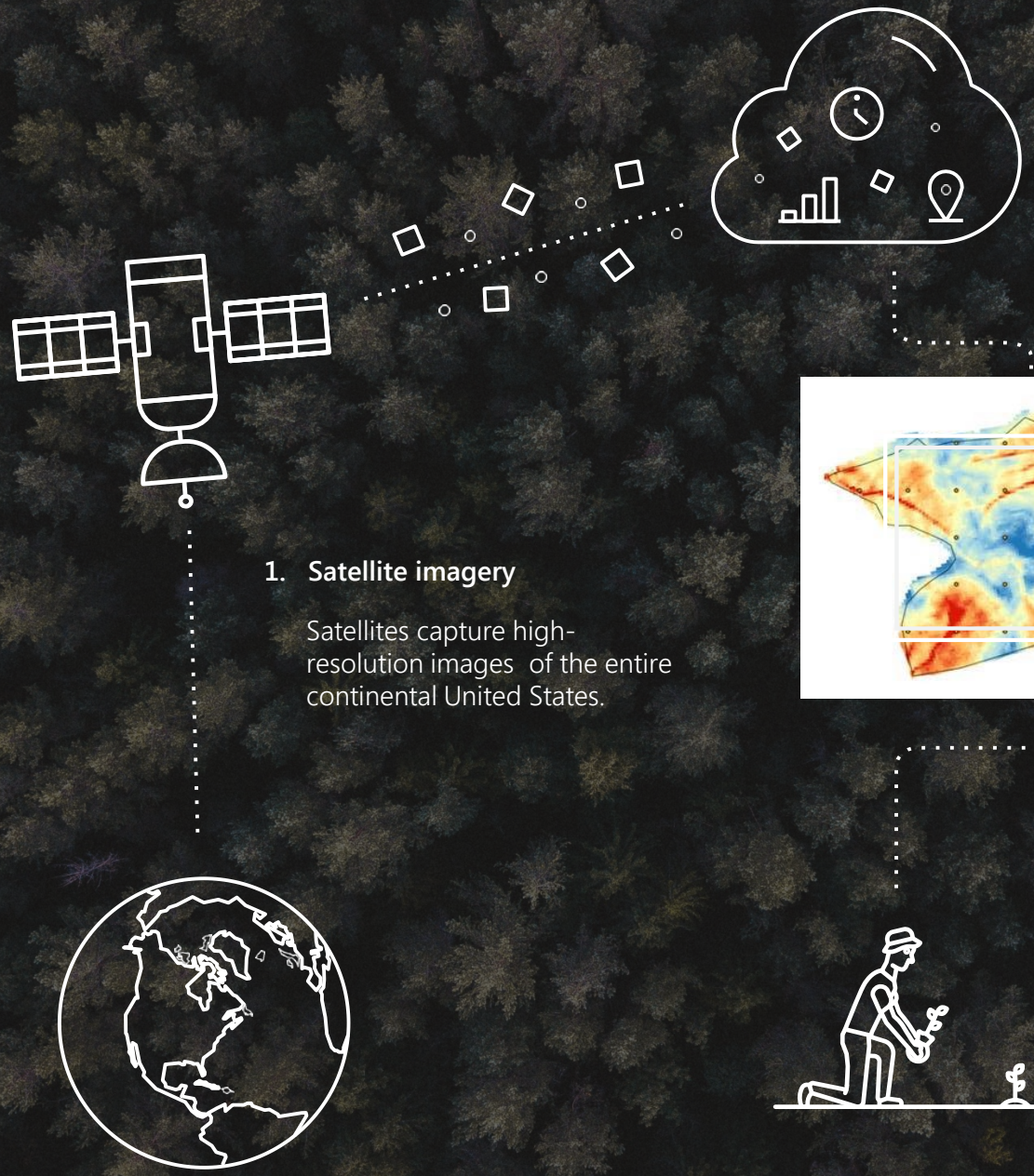

Microsoft
Grantee Map
www.aka.ms/ai4emap


SILVIATERRA
537 million acres
800 terabytes
at 10x speed
92 billion trees


PONDEROSA PINE

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.



1. **Satellite imagery**

   Satellites capture high-resolution images of the entire continental United States.

2. **Microsoft Azure**

   Satellite imagery is stored on Azure, where SilviaTerra pairs it with field data from the USFS Forest Inventory and Analysis program to train machine-learning models for predicting the sizes and species of trees.

3. **Detailed forest maps**

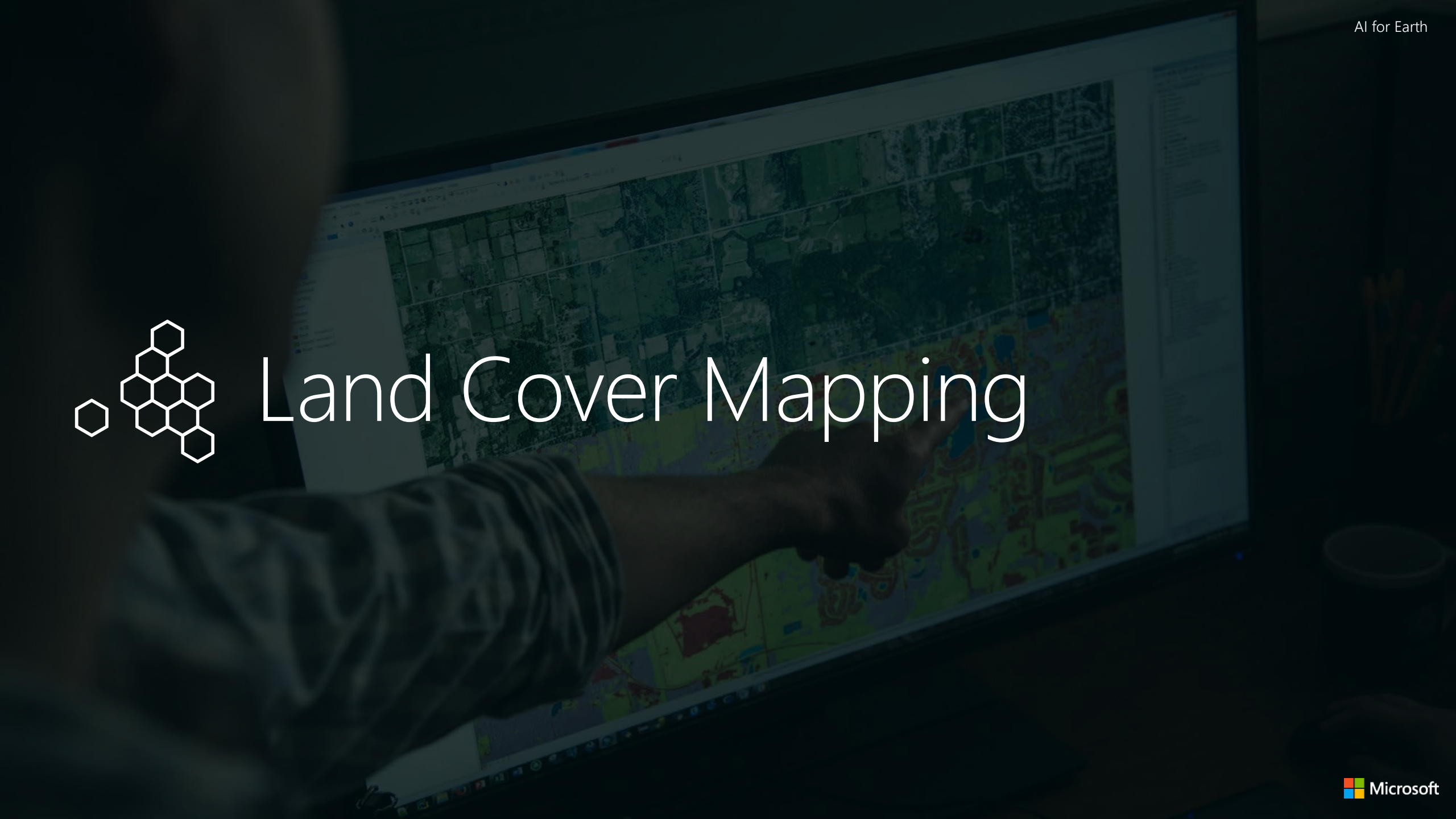
   SilviaTerra uses Azure HDInsight to apply these machine-learning models to terabytes of satellite imagery covering all forests in the United States.

4. **Improved insights**

   This first ever high-resolution, tree-level map of the continental United States provides conservationists, governments, and landowners with unprecedented information about their forests. Better data drives better forest management, helping improve ecological, social, and economic outcomes for America's forest owners.

Demo

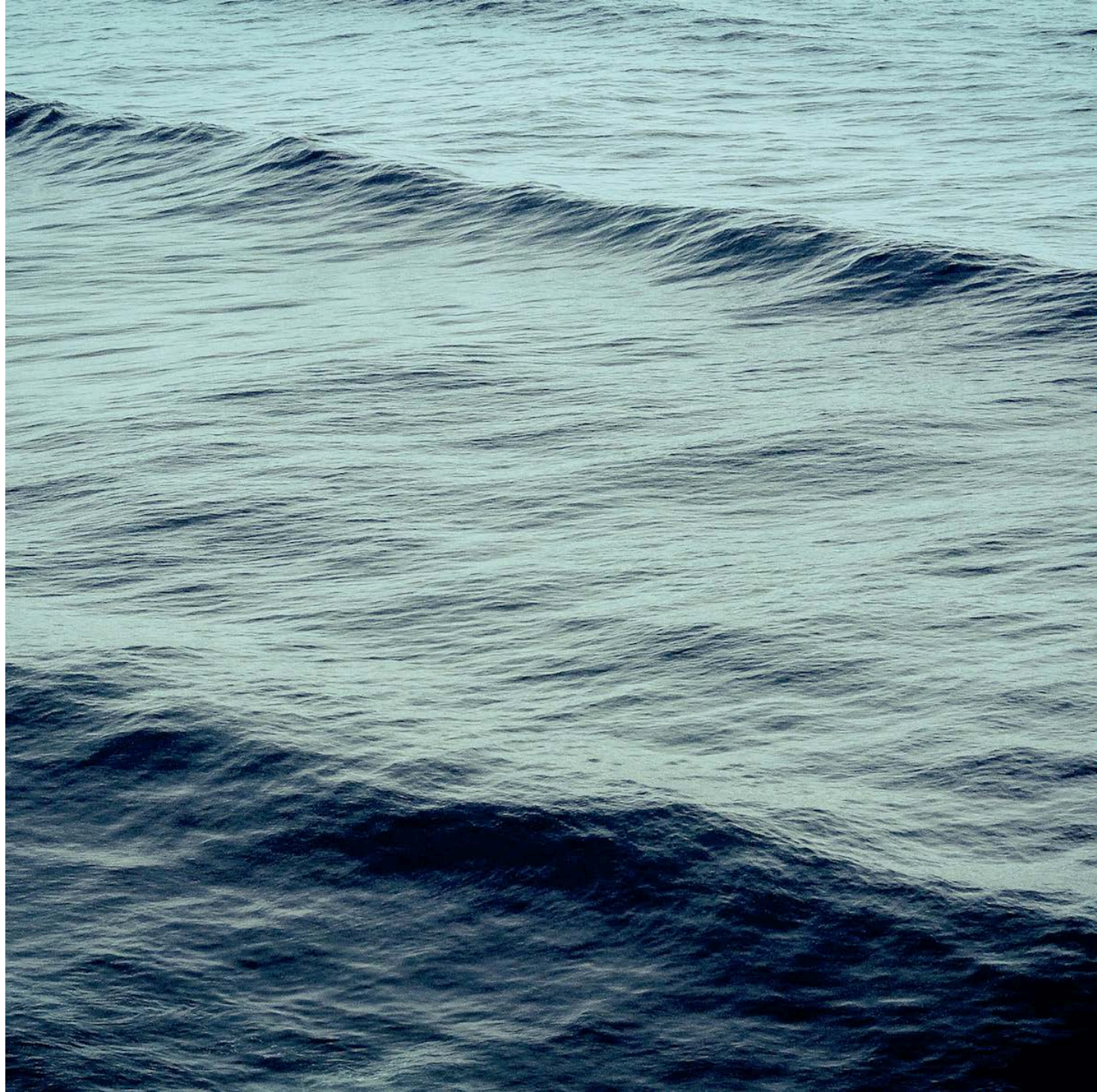
https://www.microsoft.com/inculture/tree-potential-project/



Land Cover Mapping

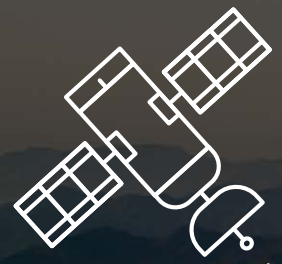
Land cover classification use cases

- Deforestation (contractual obligations – save 20% of land)
- Coastal resiliency
- Monitoring flood waters
- Preparing for class 3 hurricane
- Urban planning
- Figure out the best places to plant trees
- Landslide prediction and root cause analysis



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.

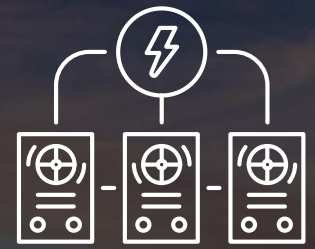


2. Remote sensing

Imagery of the studied area is collected from platforms like drones, airplanes, and satellites.

3. Microsoft Azure

Azure stores all of this data for ready access by AI systems.



4. Model training

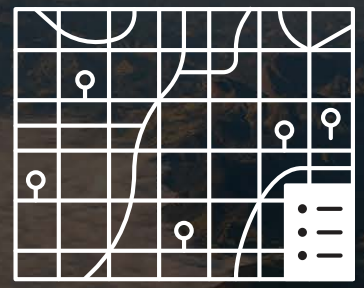
Batch AI leverages hundreds of GPUs to train the model.

5. Model development

The GeoAI DSVM expedites the processing of new imagery, providing rapid mapping results.

1. Land area

A land area is identified to study.



6. Insight

Detailed maps give researchers insights to monitor climate change, understand the impacts of urbanization, and better plan for natural disasters.

Microsoft

Land Classification Model in Action

Aerial photo

1m resolution, input data

Existing land cover map

Created 7 years ago, out of date

Land classification model

Show mix of probabilities across land cover types

Land classification model

Classifying on the fly, and detects new roundabout

Oakland, Michigan

Use of Project Brainwave in Land Cover Mapping

Data

esri Aerial Images for the Entire US

NAIP Data

Stored on **Azure Premium Storage**

Build

Geo AI Data Science Virtual Machine

Visual Studio Tools for AI

Train

Azure Machine Learning

Azure Batch AI

Land Classification Model
ResNet-50

Deploy

Ultra-fast Inferencing using FPGAs

200M Images, 20TB

Land cover mapping for the whole of US in

10+ minutes

Demo

https://builddemo-ai4e-landcover.azurewebsites.net/index.html

Questions?

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Microsoft