AI for Earth

Leveraging Azure AI in Environmental Science

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@BrianLKeith

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.

Why AI?

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.**

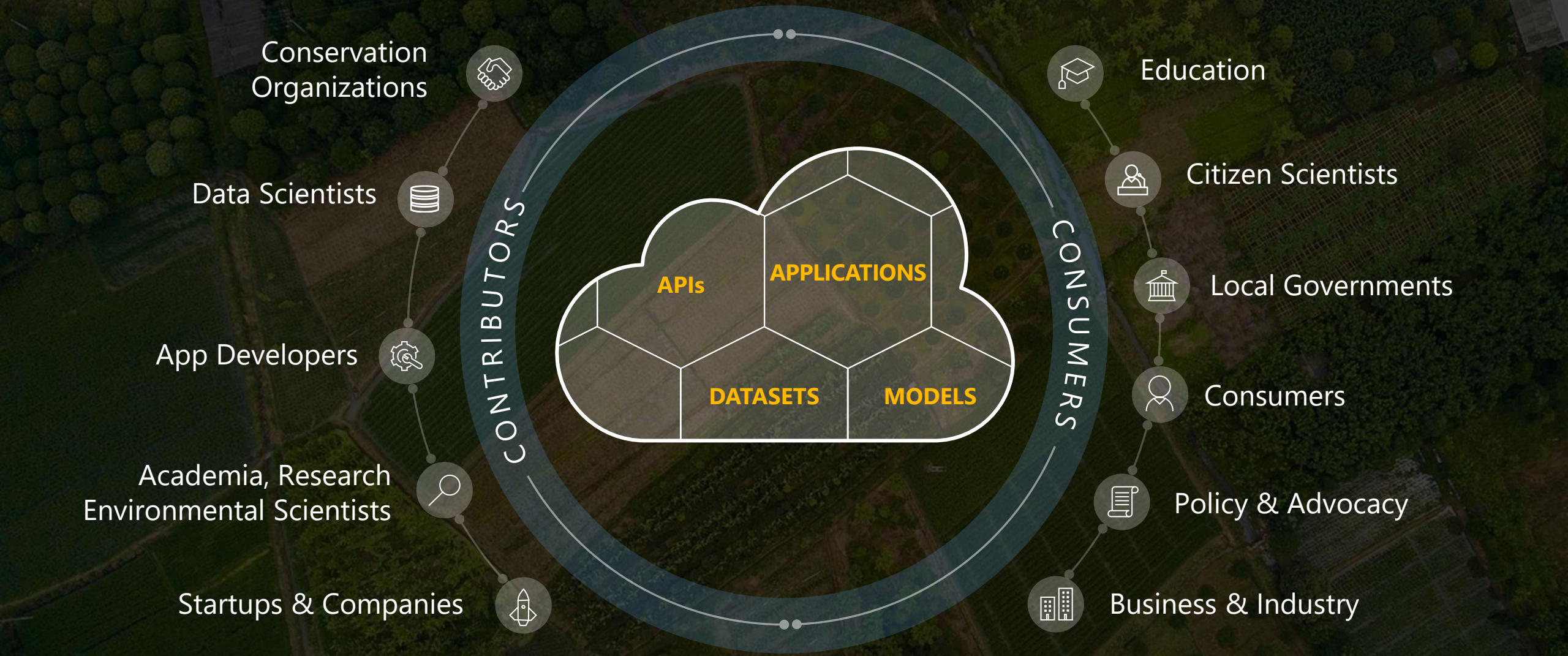
Brad Smith,
Microsoft President

What is AI for Earth?

AI for Earth

Empowering people and organizations to develop innovative solutions to the way we **monitor**, **model**, and ultimately **manage** Earth's natural systems

Building planetary insight



Focus areas

Areas that are vital in building a sustainable future:

Agriculture

Feed the growing world population

Water

Conserve and protect water sources

Biodiversity

Monitor and protect species from extinction

Climate change

Reduce climate change impact on communities

Our progress

Pillars of the program

Grants

Increase access to cloud and AI technologies

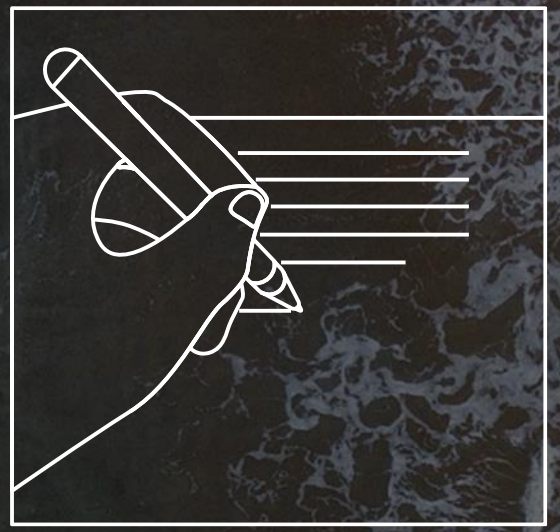
Technology

Build machine learning tools that support and accelerate the work of environmental scientists

Data

Host and make accessible key environmental and conservation datasets

How does the Grants Program work?



Who
Any individual or organization, anywhere in the world

What
Access to Microsoft Cloud and AI technologies through Azure credits

How
A project proposal defining the problem and how AI will be used

When
Proposals are accepted on a rolling basis four times a year

2021 Deadlines: April 5, July 5 & October 4

www.microsoft.com/en-us/ai/ai-for-earth-grants

Resources provided for grantees

AI for Earth community

Connect with AI for Earth grantee and alumni community on a Microsoft Teams site

Access to the AI for Earth team and other teams at Microsoft for questions and additional opportunities

Technical support

Monthly office hours hosted on Teams by Microsoft data scientists and engineers

Internal grantee site with curated educational resources (Azure, ML, cloud computing)

AI for Earth Summit

Held virtually twice a year

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

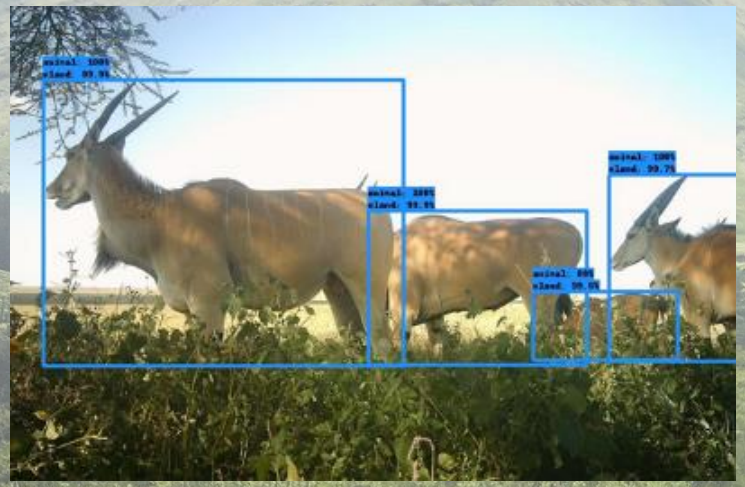
Partner-provided resources

1-year ArcGIS license sponsored by Esri

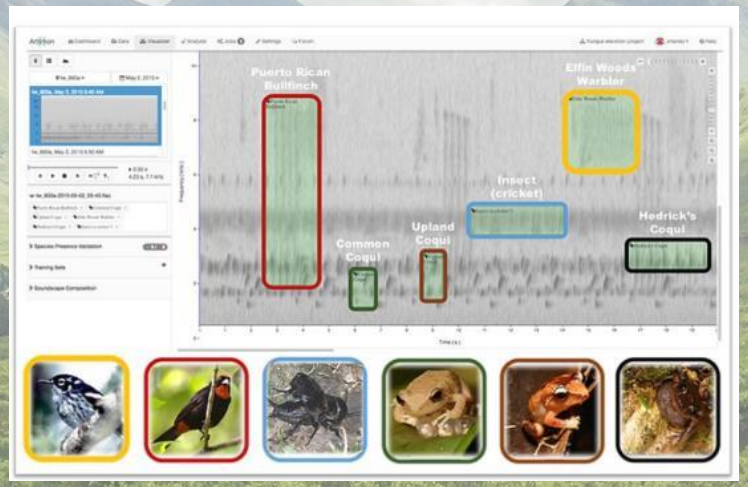
Access to datasets via Skywatch EarthCache

Technology: AI for Earth data science

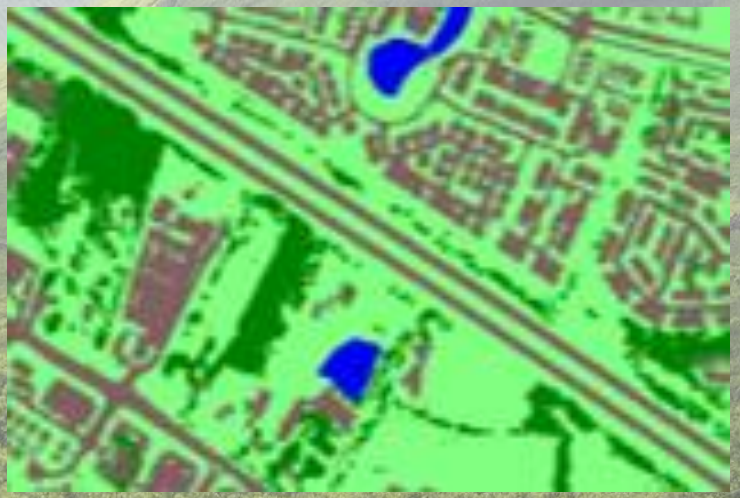
Using machine learning to help conservation scientists spend less time clicking stuff, and more time doing conservation work.



Accelerating camera trap surveys



Accelerating bioacoustic wildlife surveys



Accelerating land cover surveys

Data: Environmental datasets on Azure

AI for Earth hosts key geospatial and conservation datasets on Azure so that our grantees – and anyone else applying technology to conservation – can use the power of the Azure cloud to operate on global-scale environmental data. Examples include the four datasets below.

NAIP

High-resolution aerial imagery across the continental U.S.

NAIP on Azure Open Datasets

MODIS surface reflectance

500m-resolution global daily surface reflectance dating back to 2000

MODIS on Azure Open Datasets

Harmonized Landsat Sentinel-2

30m-resolution satellite imagery for North America

HLS on Azure Open Datasets

GOES-16

Weather imagery of the Americas

GOES-16 on Azure Open Datasets

https://azure.microsoft.com/en-us/services/open-datasets/catalog/

You can help us help you!

We want to know about…

- The public data sets you use
- The formats that delight/annoy you
- The tools you use to access/process data
- Your experiences with the data we host
- Your experiences with the data other clouds host

aiforearthdatasets@microsoft.com

AI for Earth partnerships

TECHNOLOGY PARTNERS

NOAA
BREEZE TECHNOLOGIES
esri
WILD ME
OCEAN MIND
Ag-Analytics
azavea
iNaturalist
vizzuality.
SunCulture
CONSERVATION INTERNATIONAL
NatureServe
Connecting Science With Conservation
TERRAFUSE
Agrimetrics
Cloud Agronomics
SILVIATERRA
CONSERVATION SCIENCE PARTNERS
Met Office
development SEED
OOI CLOUD
Conservation Metrics
Improving conservation through better monitoring

SIGNATURE PROJECTS

CSIRO
sustainable coastlines
Imazon
Heathrow
World Mosquito Program
EVERGREEN
FUNDAÇÃO S.O.S. MATA ATLÂNTICA
MAYOR OF LONDON
Arab Republic of Egypt
Ministry of Communications
and Information Technology
BREEZE TECHNOLOGIES

ACADEMIC INSTITUTIONS

NCEAS
WAGENINGEN UNIVERSITY & RESEARCH
USC Center for Artificial Intelligence in Society
UNIVERSITY OF MINNESOTA
Driven to Discover
COLUMBIA UNIVERSITY
University of Pittsburgh

GRANTS & COMPETITIONS

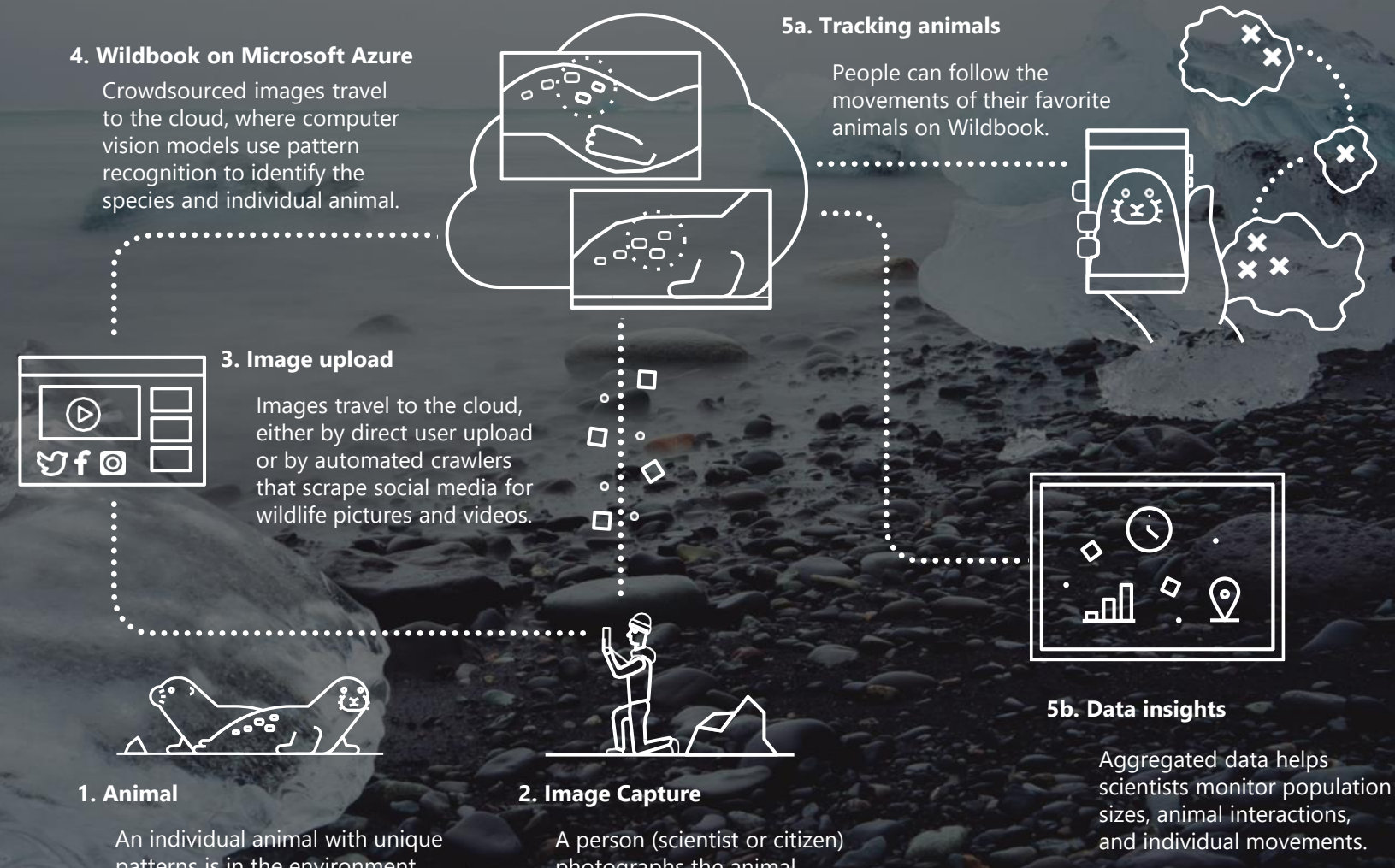
NATIONAL GEOGRAPHIC SOCIETY
GEO BON
WORLD RESOURCES INSTITUTE
DRIVENDATA
GLOBAL WILDLIFE CONSERVATION
CONSERVATION X LABS
LEONARDO DICAPRIO FOUNDATION

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.

5a. Tracking animals

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

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.

5b. Data insights

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

1. Animal

An individual animal with unique patterns is in the environment.

2. Image Capture

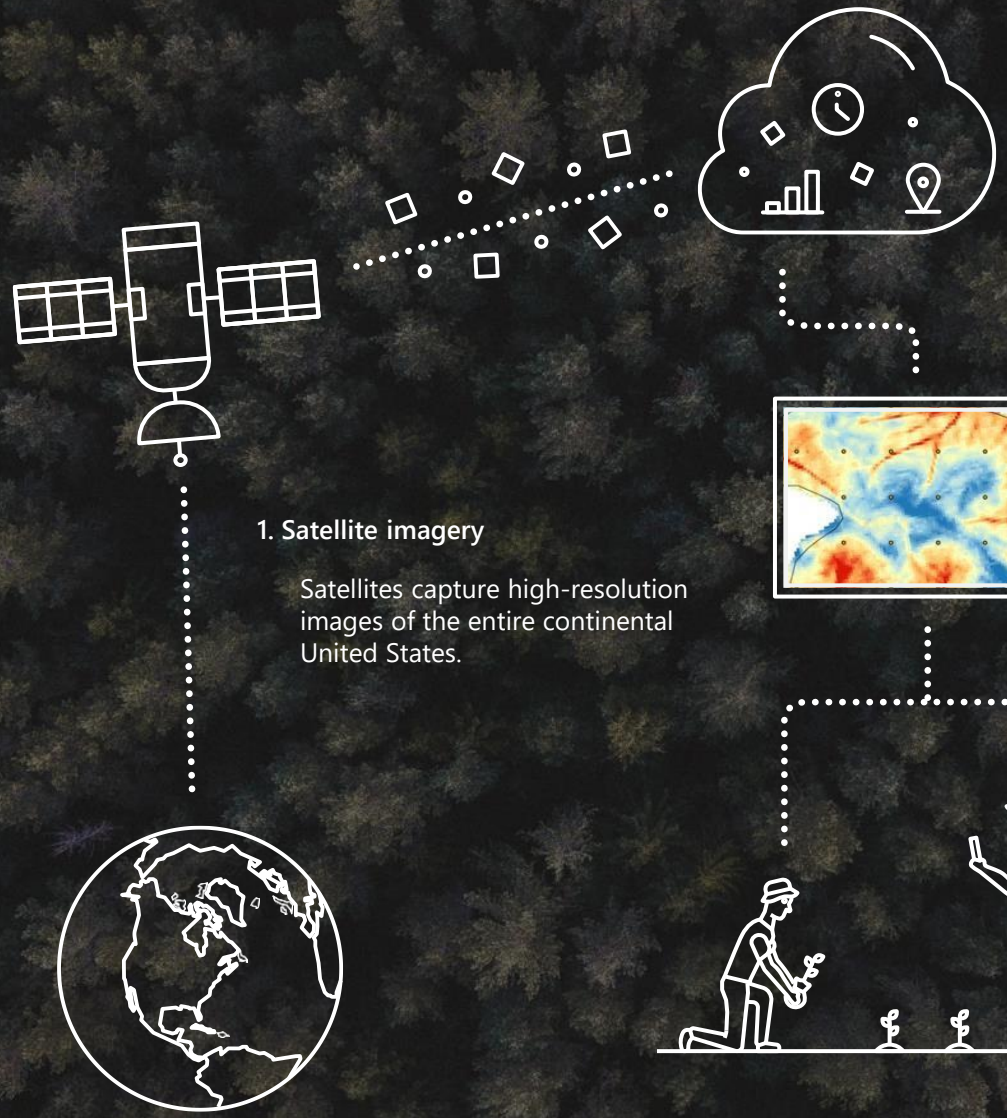
A person (scientist or citizen) photographs the animal.

Microsoft


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

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.

Microsoft

Land Cover Mapping

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

Microsoft

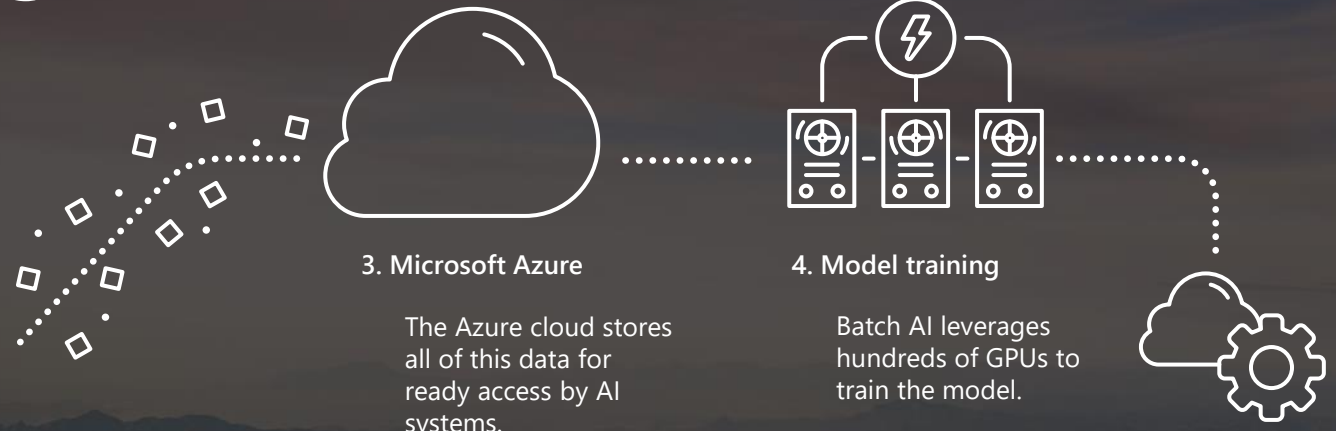
Chesapeake Conservancy
EXPLORE. CONSERVE. INNOVATE.

esri
THE SCIENCE OF WHERE

Microsoft

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.



1. Land area

A land area is identified to study.

2 . Remote sensing

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

3. Microsoft Azure

The Azure cloud 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.

6. Insight

Researchers are able to review land cover in great detail, providing insights to monitor climate change, understand the impacts of urbanization, and better plan for natural disasters.

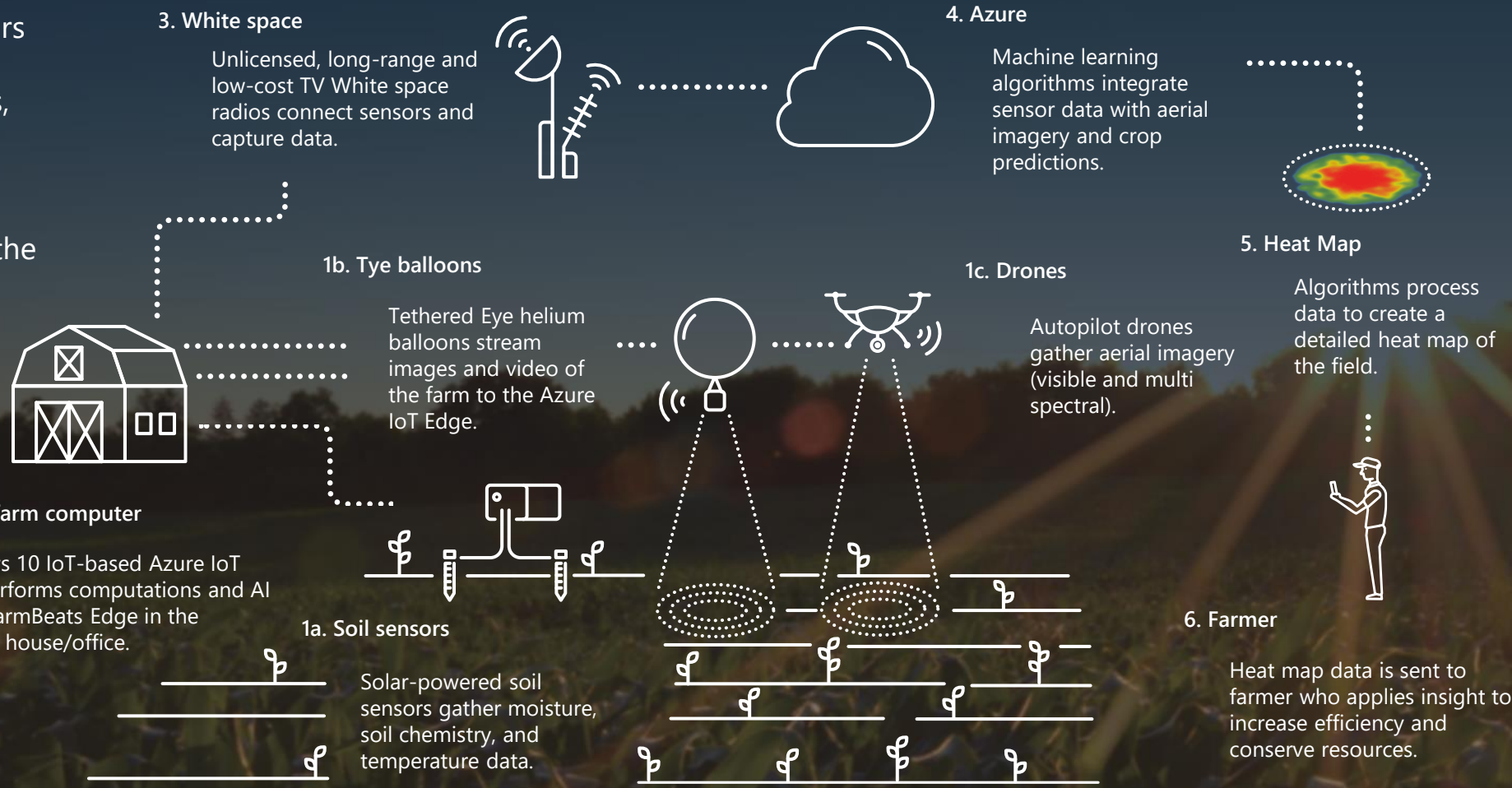
Microsoft

FarmBeats

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

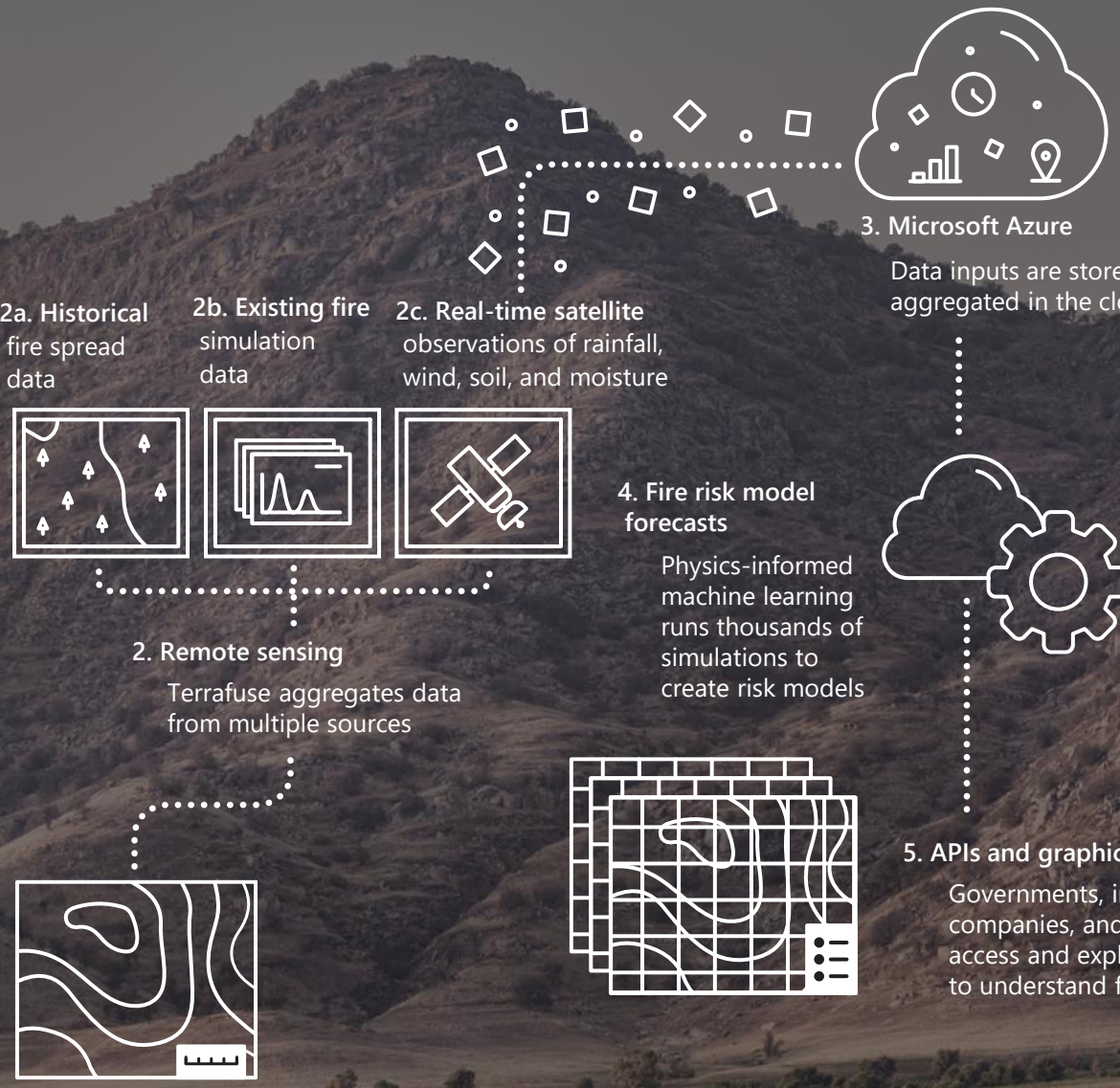
FarmBeats

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.



Terrafuse

Terrafuse uses machine learning algorithms on the terrafuse.ai platform to create sophisticated climate-risk models. In partnership with Microsoft, Terrafuse is combining historical data, existing wildfire simulations, and real-time satellite observations to create hyperlocal models of wildfire risk.



Breeze Technologies

Breeze Technologies develops compact air quality sensors that use cloud and AI technology to collect air quality data in real time, creating hyperlocal maps that help cities and building managers better understand—and improve—outdoor and indoor air quality.

2. Air quality sensors

Sensors collect air quality data in real time.

3. Microsoft Azure

Data is sent to Azure, where adaptive cloud calibration technology removes external influences like humidity/temperature fluctuations, sensor drift, and cross-sensitivities.

5. Recommendations

AI then makes clear-air action recommendations, helping cities and building managers mitigate air pollution in their areas.

1. Cities and buildings

Cities and building managers across the world want to measure air quality for the safety of their residents.

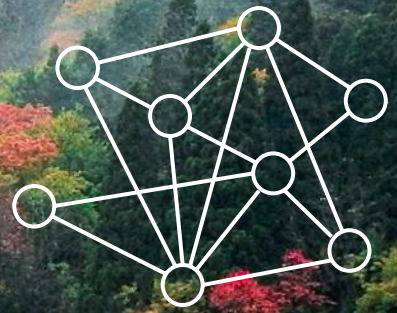
4. Hyperlocal maps

Azure AI validates and matches the data to its location to create hyperlocal air quality maps.

What's next for AI for Earth

As we continue to grow, our goal is two-fold:

Continue to put Microsoft cloud and AI tools in the hands of those driving scientific discovery and the development of innovative solutions to help protect the planet.



Make large geospatial datasets more accessible to the sustainability community, through APIs and tools that facilitate large-scale geospatial analysis on Azure.

aiforearthdatasets@microsoft.com

Learn more about sustainability at Microsoft

How To Apply for Grant:

- Contact Laura Dobbs: **LADOBBS@Microsoft.com**
- OR on AI For Earth's **Grant Page**

Environmental Sustainability
microsoft.com/environment

AI for Earth
microsoft.com/aiforearth

Microsoft


Thank you

Microsoft

Training & Skilling Proposal

Please Contact Laura Dobbs (NOAA Account Executive) to get access to training options.

LADOBBS@Microsoft.com

These training options are provided at no cost to NOAA. They are a “benefit” in NOAA’s Enterprise Agreement.

Microsoft Azure Training and Certifications

Role-based

Technical skills required to perform a job

Apps & Infra

Data & AI

	Apps & Infra	Data & AI
	Azure Solution Architect	
Expert	Azure DevOps Engineer	
	Azure Administrator	Azure Data Scientist
	Azure Developer	Azure AI Engineer
Associate	Azure Security Engineer	Azure Data Engineer

Fundamentals

Foundational understanding of technology

Azure Fundamentals

Skilling path: Azure Administrator (customer role name)

Certification:
- AZ-103

Description: Azure Administrators implement, monitor, and maintain Microsoft Azure solutions, including major services related to compute, storage, network, and security.

	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
T1 Foundational	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Introduction to Azure for IT Professionals & Developers (10979)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	12/25	Cost
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Azure Administrator (AZ-103)	Instructor-Led (In Person or Virtual)	4 Days	MSFT or Learning Partner	15/20	Cost
	Administer infrastructure resources in Azure	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Automation with Azure PowerShell and ARM Templates	Online, Self-Paced	2 hours	LinkedIn Learning	N/A	Cost
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Building a resilient IaaS architecture (40513)	Facilitated Workshop	1 day	MSFT or Learning Partner	5/10	Free*
	Business continuity and disaster recovery (40528)	Facilitated Workshop	1 day	MSFT or Learning Partner	5/10	Free*

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- TPMs are to customize the Skilling Plan based on the needs of the customer.

- TBD: Cost ($) – there are costs associated with some trainings; work with your TPM to confirm.
- **To find your preferred learning partner, please verify the preferred learning partner list in this deck. Workshop deliveries by learning partners will incur costs.*

Skilling path: Azure Developer (customer role name)

Certification:
- AZ-203

Description: Azure Developers design and build cloud solutions such as applications and services. They participate in all phases of development, from solution design, to development and deployment, to testing and maintenance. They partner with cloud solution architects, cloud DBAs, cloud administrators, and clients to implement the solution.

	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
T1 Foundational	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Introduction to Azure for IT Professionals & Developers (10979)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	20/25	Cost
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Azure Developer	Instructor-Led (In Person)	5 days	MSFT or Learning Partner	15/20	Cost
	Administer infrastructure resources in Azure	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Automation with Azure PowerShell and ARM Templates	Online, Self-Paced	2 hours	LinkedIn Learning	N/A	Cost
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Cloud Workshop: Lift and Shift/Azure Resource Manager	Facilitated Workshop	3 days	MSFT or Learning Partner	5/15	Free*
	Cloud Workshop - Azure security and management	Facilitated Workshop	3 days	MSFT or Learning Partner	5/15	Free*

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Skilling path: Azure Solutions Architect (customer role name)

Certification:
- AZ-300 AND AZ-301

Description: Azure Solution Architects advise stakeholders and translate business requirements into secure, scalable, and reliable solutions. SAs should have advanced experience and knowledge across various aspects of IT operations, including networking, virtualization, identity, security, business continuity, disaster recovery, data management, budgeting, and governance. This role requires managing how decisions in each area affects an overall solution.

	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
T1 Foundational	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Introduction to Azure for IT Professionals & Developers (10979)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	20/25	Cost
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Azure Solution Architect Technologies (AZ-300)	Instructor-Led (In Person or Virtual)	5 Days	MSFT or Learning Partner	15/20	Cost
	Azure Solution Architect Design (AZ-301)	Instructor-Led (In Person or Virtual)	4 Days	MSFT or Learning Partner	15/20	Cost
	Architect great solutions in Azure	Online, Self-Paced	4 hours	MS Learn	---	Free
	Manage resources in Azure	Online, Self-Paced	4 hours	MS Learn	---	Free
	Architecting Azure Infrastructure	Online, Self-Paced	1 hour	LinkedIn Learning	---	Cost
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Enterprise Ready-Cloud (40503)	Facilitated Workshop	1 Day	MSFT or Learning Partner	20-25	Free*
	Enterprise class networking in Azure (40515)	Facilitated Workshop	1 Day	MSFT or Learning Partner	20-25	Free*

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Skilling path: Azure DevOps Engineer (customer role name)

Certification:
- AZ-103 or AZ-203
- AZ-400

Description: DevOps professionals who combine people, process, and technologies to continuously deliver valuable products and services that meet end user needs and business objectives. DevOps professionals streamline delivery by optimizing practices, improving communications and collaboration, and creating automation. They design and implement strategies for application code and infrastructure that allow for continuous integration, continuous testing, continuous delivery, and continuous monitoring and feedback.

	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
T1 Foundational	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Introduction to Azure for IT Professionals & Developers (10979)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	15/20	Cost
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Role-Based Prerequisite (Azure Administrator **OR** Azure Developer)	Instructor-Led (In Person or Virtual)	Varies	MSFT or Learning Partner	15/20	Cost
	Azure DevOps Engineer (AZ-400)	Instructor-Led (In Person or Virtual)	5 Days	MSFT or Learning Partner	15/20	Cost
	Automation with Azure PowerShell and ARM Templates	Online, Self-Paced	2 hours	LinkedIn Learning	N/A	Cost
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Continuous delivery in Azure DevOps (40511)	Facilitated Workshop	1 Day	MSFT or Learning Partner	5/15	Free*
	Azure DevOps Openhack	Hackathon Workshop	1 Day	CSE	5/20	Free

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Skilling path: Azure Security Engineer (customer role name)

Certification:
- AZ-500

Description: Microsoft Azure Security Engineers implement security controls, maintain the security posture, manages identity and access, and protects data, applications, and networks. Security engineers identify and remediate vulnerabilities by using a variety of security tools, implements threat protection, and responds to security incident escalations. Security engineers often serve as part of a larger team dedicated to cloud-based management and security and may also secure hybrid environments as part of an end-to-end infrastructure.

	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
T1 Foundational	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Azure Security Engineer (AZ-500)	Instructor-Led (In Person or Virtual)	5 Days	MSFT or Learning Partner	15-20	Cost
	Secure your cloud data	Online, Self-Paced	6 hours	MS Learn	N/A	Free
	Design for security in Azure	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Microsoft Azure Security Center: Securing Cloud Resources	Online, Self-Paced	2 hours	LinkedIn Learning	N/A	Cost
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Cloud Workshop - Azure security and management	Facilitated Workshop	3 days	MSFT	5-10	Free

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Skilling path: Azure Data Scientist (customer role name)

Certification:
- DP-100

Description: Azure Data Scientists apply scientific rigor and data exploration techniques to gain actionable insights and communicate results to stakeholders. Azure Data Scientists use machine learning techniques to train, evaluate, and deploy models to build AI solutions that satisfy business objectives. They also use applications that involve natural language processing, speech, computer vision, and predictive analytics.

T1 Foundational	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Introduction to Azure for IT Professionals & Developers (10979)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	20/25	Cost
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	(DP-100) Designing and Implementing a Data Science Solution on Azure	Instructor-Led (In Person or Virtual)	3 Days	MSFT or Learning Partner	15/20	Cost
	get-started-with-azure-dsvm	Online, Self-Paced	2 hours	MS Learn	N/A	Free
	explore-data-science-tools-in-azure	Online, Self-Paced	2 hours	MS Learn	N/A	Free
	intro-to-ml-with-python	Online, Self-Paced	2 hours	MS Learn	N/A	Free
	build-ai-solutions-with-azure-ml-service	Online, Self-Paced	3.5 hours	MS Learn	N/A	Free
	data-engineering-with-databricks	Online, Self-Paced	10.5 hours	MS Learn	N/A	Free
	data-science	Online, Self-Paced	5.5 hours	MS Learn	N/A	Free
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	MLOps (40559)	Facilitated Workshop	1 Day	MSFT or Learning Partner	10	Free*
	Deep Learning with Databricks and AML (40562)	Facilitated Workshop	1 Day	MSFT or Learning Partner	10	Free*

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- TBD: Cost ($) – there are costs associated with some trainings; work with your TPM to confirm.
- **To find your preferred learning partner, please verify the preferred learning partner list in this deck. Workshop deliveries by learning partners will incur costs.*

Skilling path: Azure Data Engineer (customer role name)

Certification:
- DP-200 AND DP-201

Description: Azure Data Engineers design and implement the management, monitoring, security, and privacy of data using the full stack of Azure data services to satisfy business needs.

	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
T1 Foundational	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
	Introduction to Azure for IT Professionals & Developers (10979)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	20/25	Cost
T2 Role-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	Implementing an Azure Data Solution (DP-200)	Instructor-Led (In Person or Virtual)	3 Days	MSFT or Learning Partner	15/20	Cost
	Designing an Azure Data Solution (DP-201)	Instructor-Led (In Person or Virtual)	2 Days	MSFT or Learning Partner	15/20	Cost
	azure-for-the-data-engineer	Online, Self-Paced	2 hours	MS Learn	N/A	Free
	data-engineering-with-databricks	Online, Self-Paced	11 hours	MS Learn	N/A	Free
	implement-sql-data-warehouse	Online, Self-Paced	3.5 hours	MS Learn	N/A	Free
T3 Workload-Based	**Training Course**	**Delivery Modality**	**Duration**	**Delivery Channel**	**Min/Max Attendance**	**Cost (USD $)**
	CosmosDB real-time advanced analytics	Facilitated Workshop	1 Day	MSFT or Learning Partner	10`	Free*
	SQL Server hybrid cloud	Facilitated Workshop	1 Day	MSFT or Learning Partner	10`	Free*
	Migrating to Azure SQL Databased Managed Instance	Facilitated Workshop	1 Day	MSFT or Learning Partner	10`	Free*

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Skilling path: Azure AI Engineer (customer role name)

Certification:
- AI-100

Description: Microsoft Azure AI Engineers use Cognitive Services, Machine Learning, and Knowledge Mining to architect and implement Microsoft AI solutions involving natural language processing, speech, computer vision, bots, and agents.

T1 Foundational	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
	Azure Fundamentals (AZ-900)	Instructor-Led (In Person or Virtual)	1 Day	MSFT or Learning Partner	20/100	Free
	Azure Fundamentals	Online, Self-Paced	10 hours	MS Learn	N/A	Free
T2 Role-Based	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
	Designing and Implementing an Azure AI Solution (AI-100)	Instructor-Led (In Person or Virtual)	3 Days	MSFT or Learning Partner	15-20	Cost
	Microsoft Azure Artificial Intelligence (AI) strategy and solutions	Online, Self-Paced	1 hour	MS Learn	N/A	Free
	Identify guiding principles for responsible AI in your business	Online, Self-Paced	1 hour	MS Learn	N/A	Free
	Create Intelligent Bots with the Azure Bot Service	Online, Self-Paced	2.5 hours	MS Learn	N/A	Free
T3 Workload-Based	Training Course	Delivery Modality	Duration	Delivery Channel	Min/Max Attendance	Cost (USD $)
	Intelligent Analytics	Facilitated Workshop	2 days	MSFT	10-25	Free
	IoT and the Smart City	Facilitated Workshop	2 days	MSFT	10-25	Free

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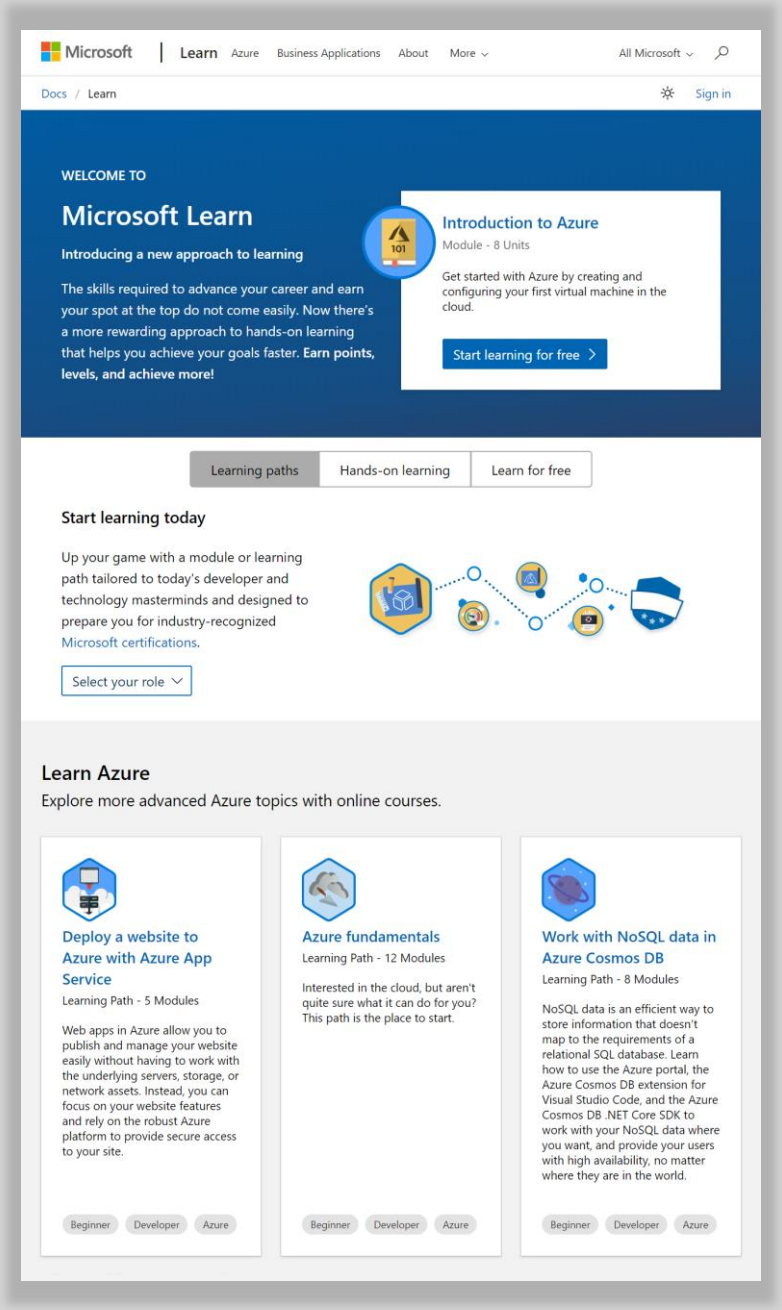

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Azure Blockchain	Enterprise ready cloud	SQL Server hybrid cloud	Cosmos DB real-time advanced analytics
OSS DevOps	Azure resource manager	Windows Server and SQL Server 2008 R2 end of support planning	Internet of Things
Linux lift and shift	Building a resilient IaaS architecture		Internet of Things for Business
OSS PaaS and DevOps	Lift and shift/Azure resource manager		Intelligent vending machines
Media AI	Enterprise class networking in Azure		
Microservices Architecture	Business continuity and disaster recovery		
Mobile app innovation	Big Compute		
Securing PaaS	Azure Stack		
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Containers and DevOps	SAP Hana on Azure		
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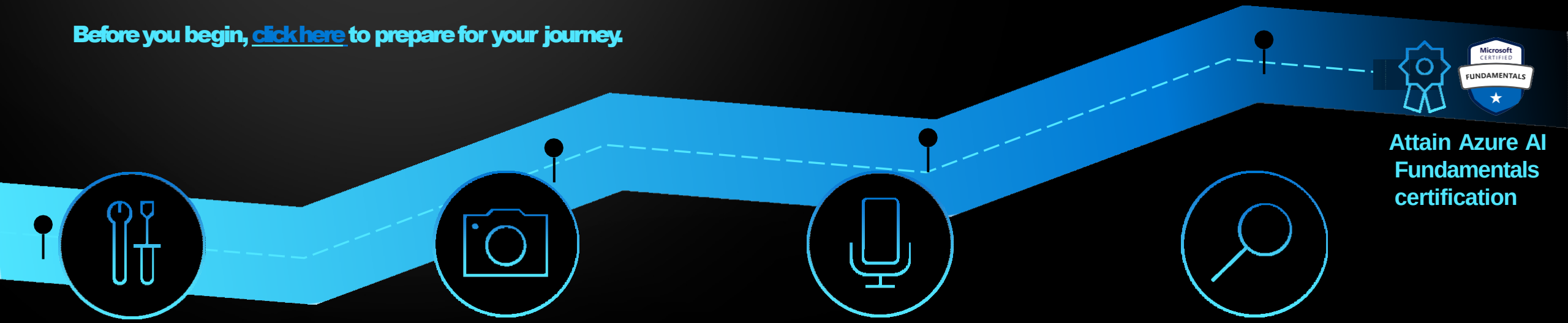

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