Microsoft

FarmBeats:
Empowering Farmers with Affordable Digital Agriculture Solutions

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The Agricultural Challenge

Global Access

1 in 9 people are undernourished (UN)

65% Reduce poverty for 65% of the world's poor who live in rural areas and work in farming

70% more food is needed by 2050

Sustainable Production

70% of global water resources are needed for Agriculture

24% of global greenhouse emission comes from Agriculture

251T liters of water to be saved in 2030 from implementing Smart Agriculture

Need for Economic Growth

30% of global workers are employed by Agriculture

10-30% Agriculture contributes 10% of global GDP and up to 30% in low income countries

$4.8T Global Agriculture revenue

Source: Sustainability development goals, UNITED NATIONS 2017

Data-driven agriculture

Precision agriculture has shown to:

- Improves yield
- Reduces cost
- Ensures sustainability

According to U.S. Department of Agriculture, high cost of manual data collection prevents farmers from using data-driven agriculture.

An end-to-end system that enables seamless data collection and insights for agriculture

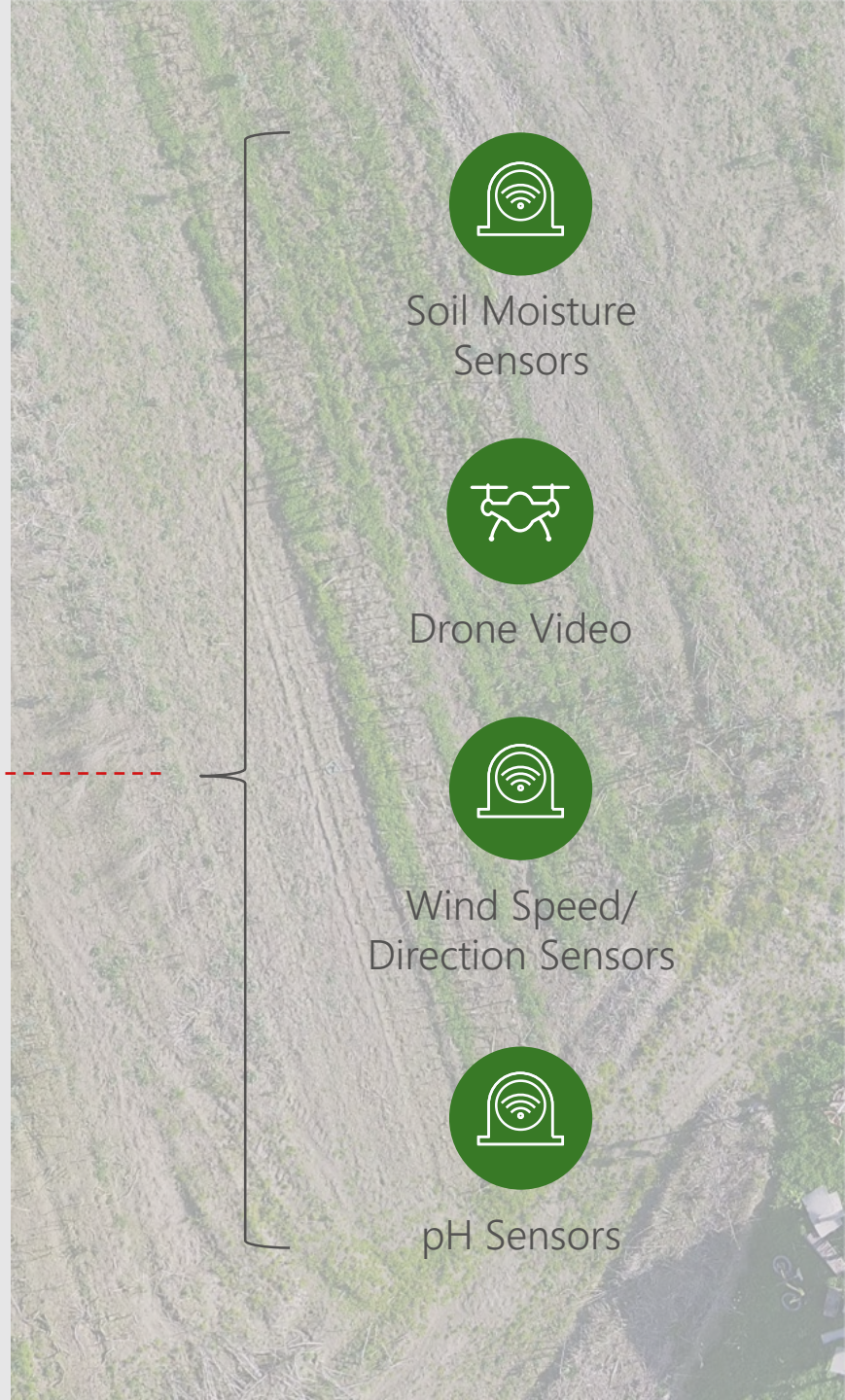
In this talk

FarmBeats: An end-to-end system that enables seamless data collection and insights for agriculture

Solves key challenges:

No farm connectivity	Precision Mapping	Slow cloud connectivity	Power on the Farm

Challenge: Farm connectivity

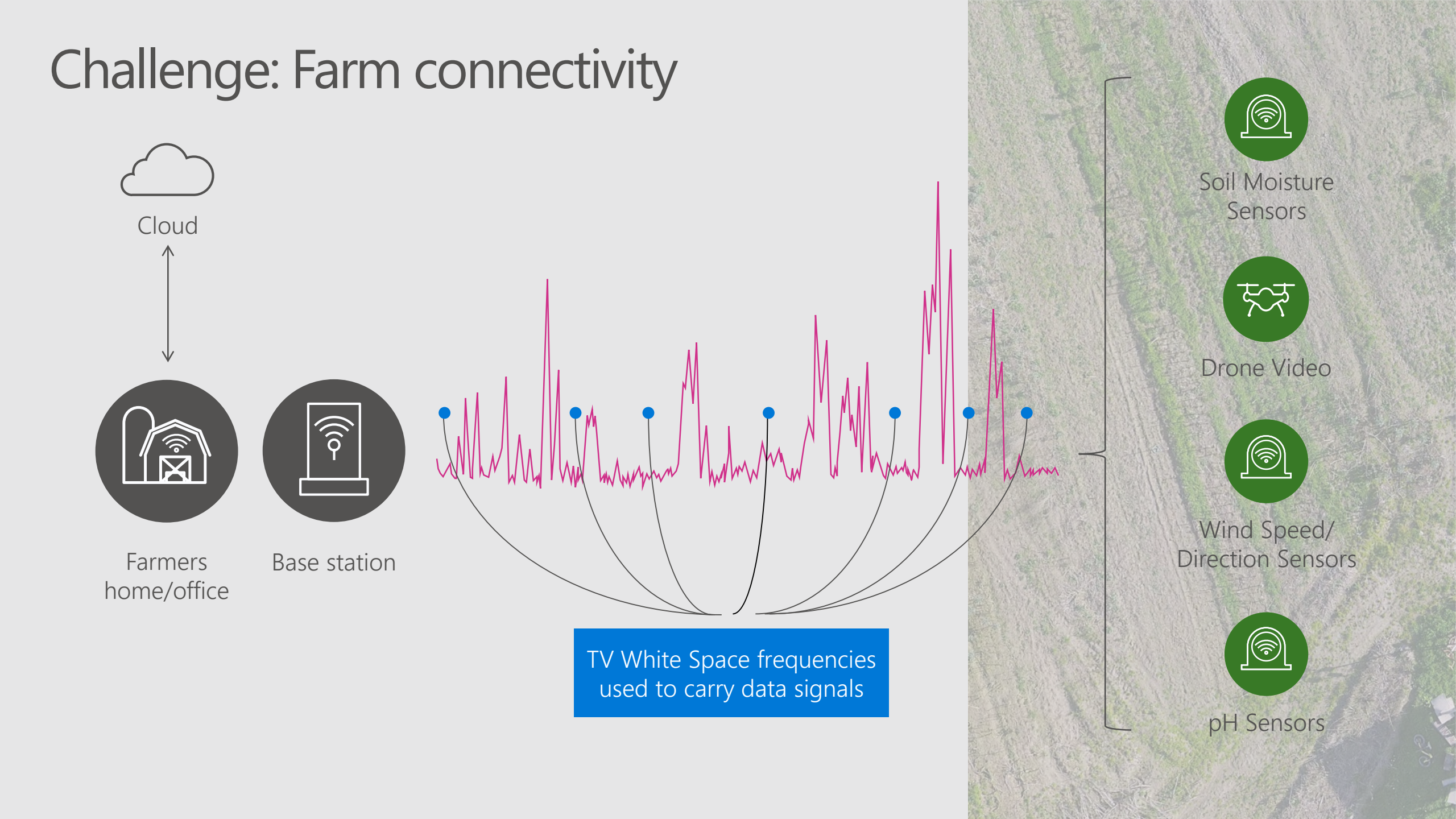


Cloud

Farmers home/office

Few miles away and obstructed by crops, canopies, etc.

Challenge: Farm connectivity



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Solves key challenges:

Connectivity on the Farm

Precision Mapping

Slow cloud connectivity

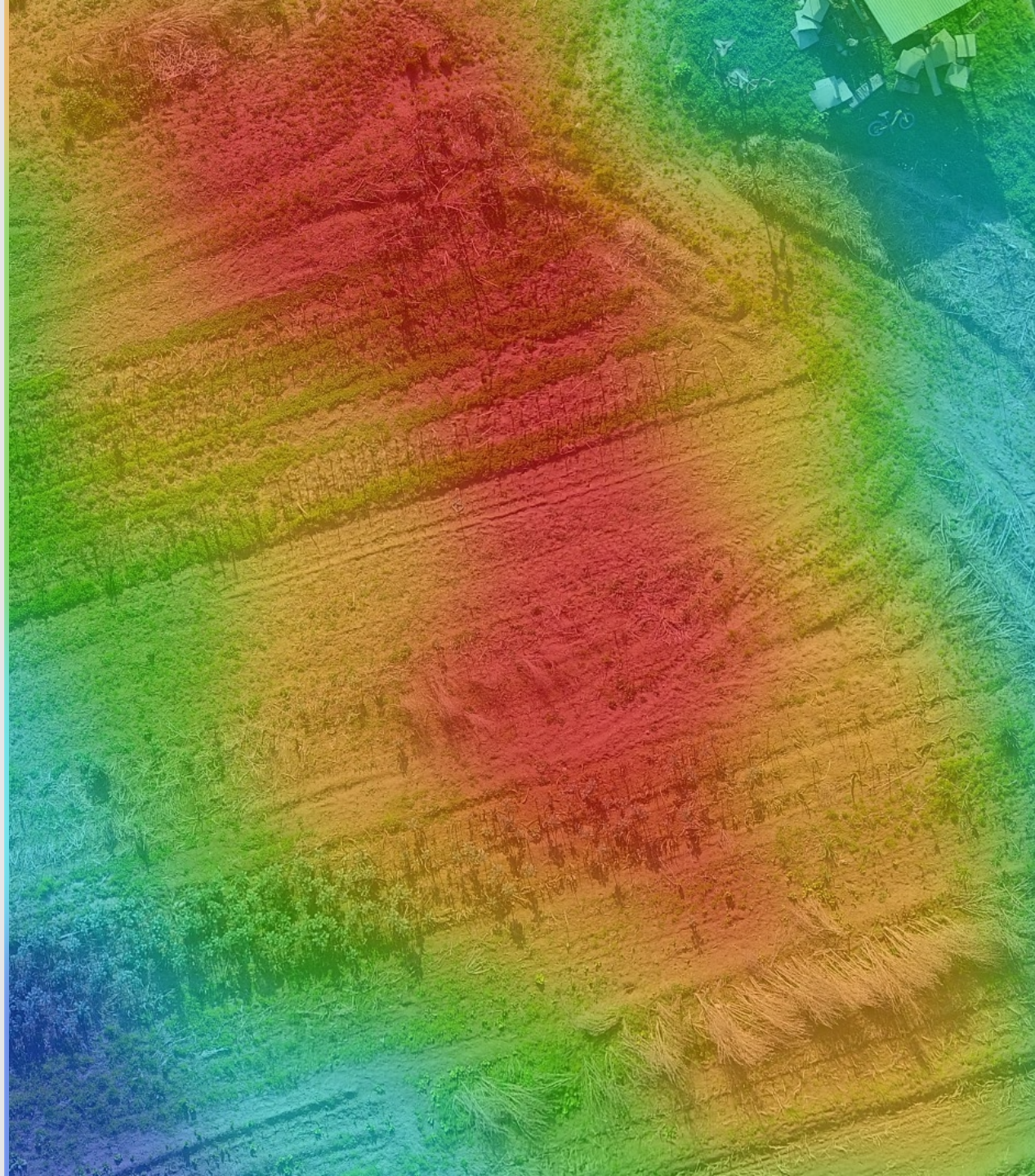
Power on the Farm

Challenge: Limited resources

Need to work with sparse sensor deployments

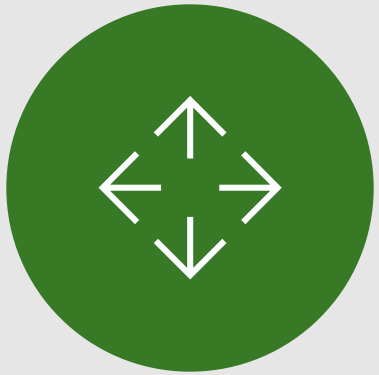
- Physical constraints due to farming practices
- Too expensive to deploy and maintain

How do we get coverage with a sparse sensor deployment?



Idea: Use drones to enhance spatial coverage

Drones are ~1000 dollars and automatic



Can cover large areas quickly

Can collect visual data

Combine visual data from the drones with the sensor data from the farm

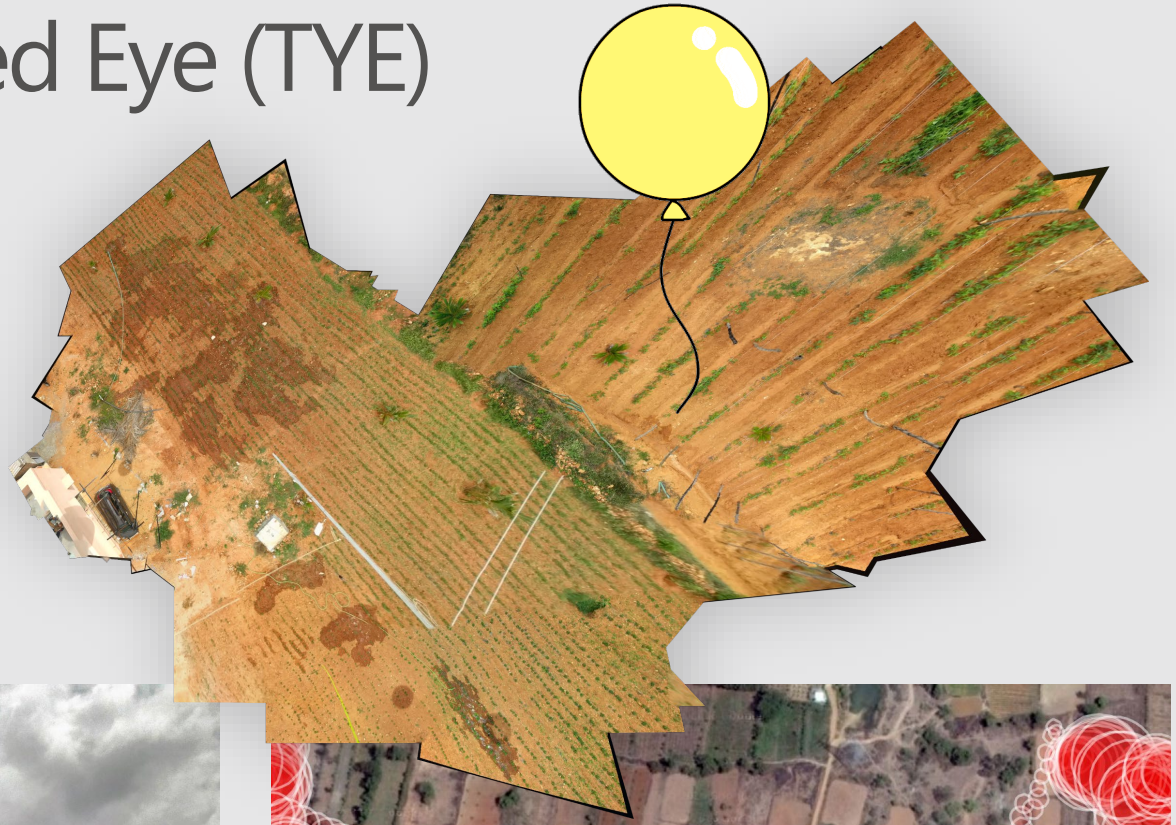
Low-cost aerial imagery: Tethered Eye (TYE)

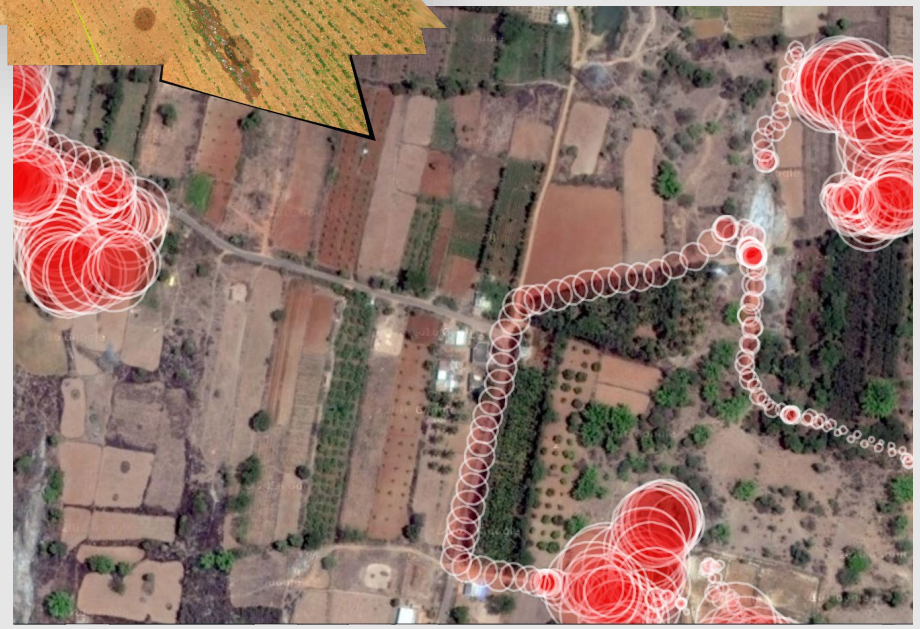
Drones have a few limitations:

limited battery life

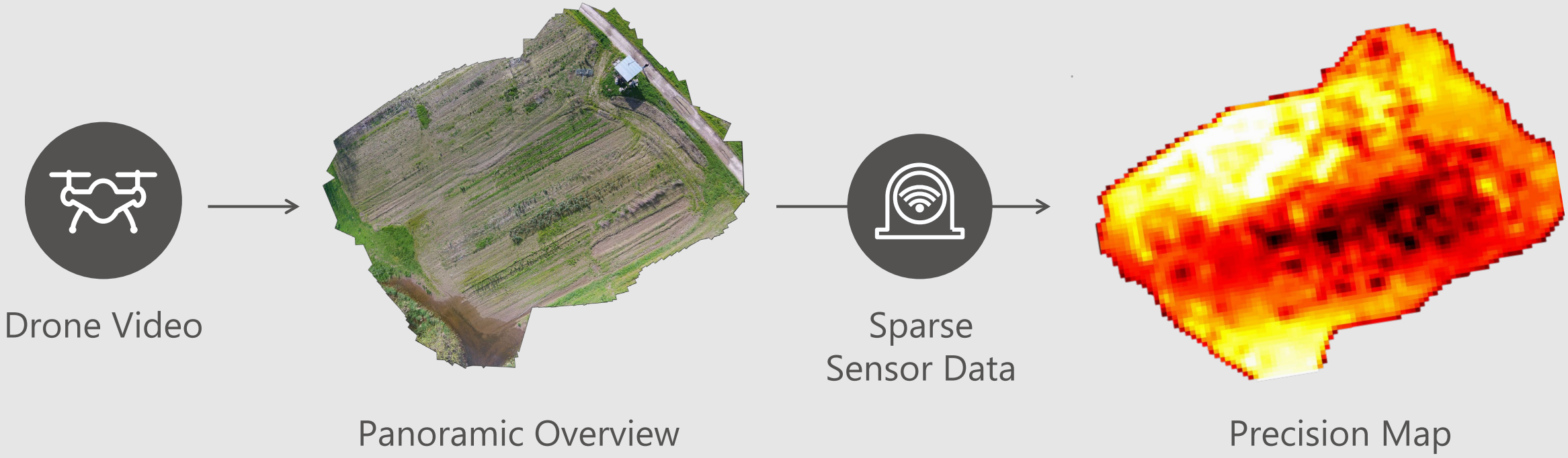
Regulatory concerns

Cost

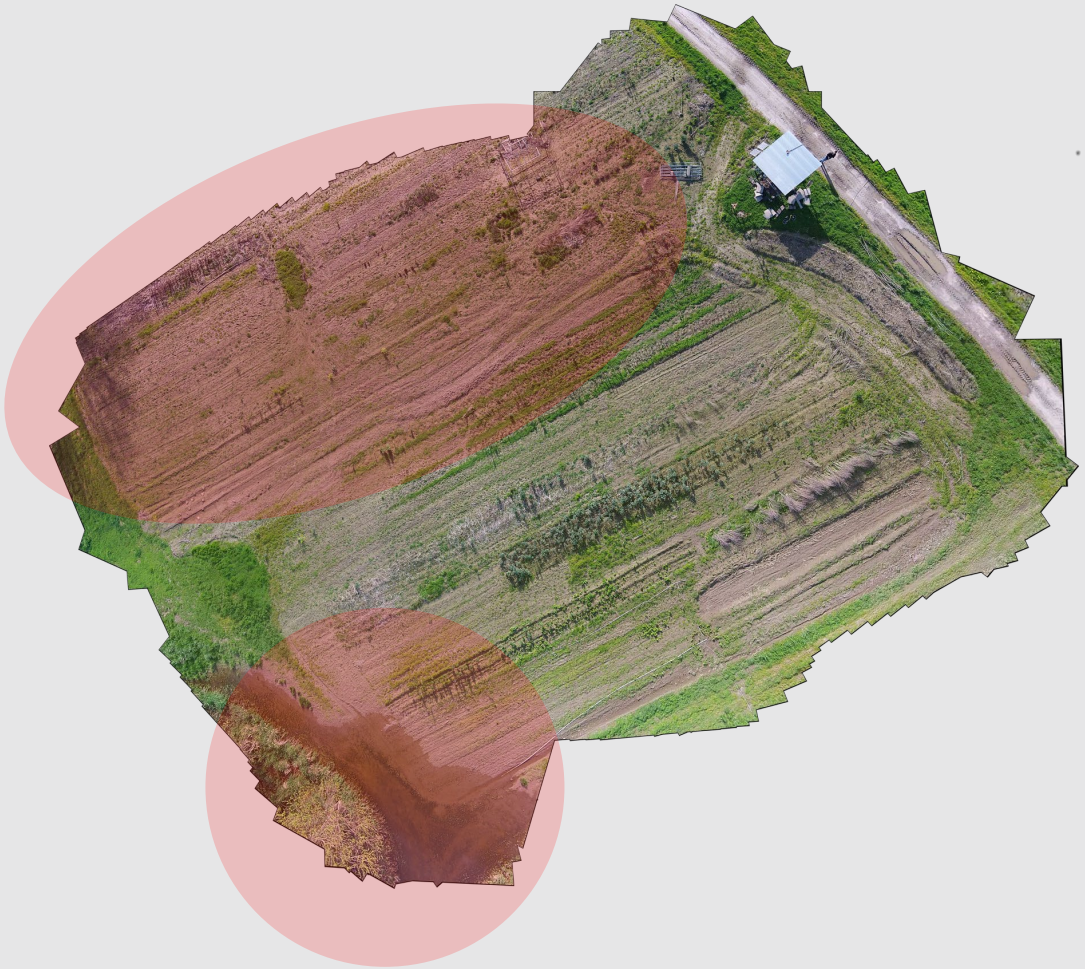


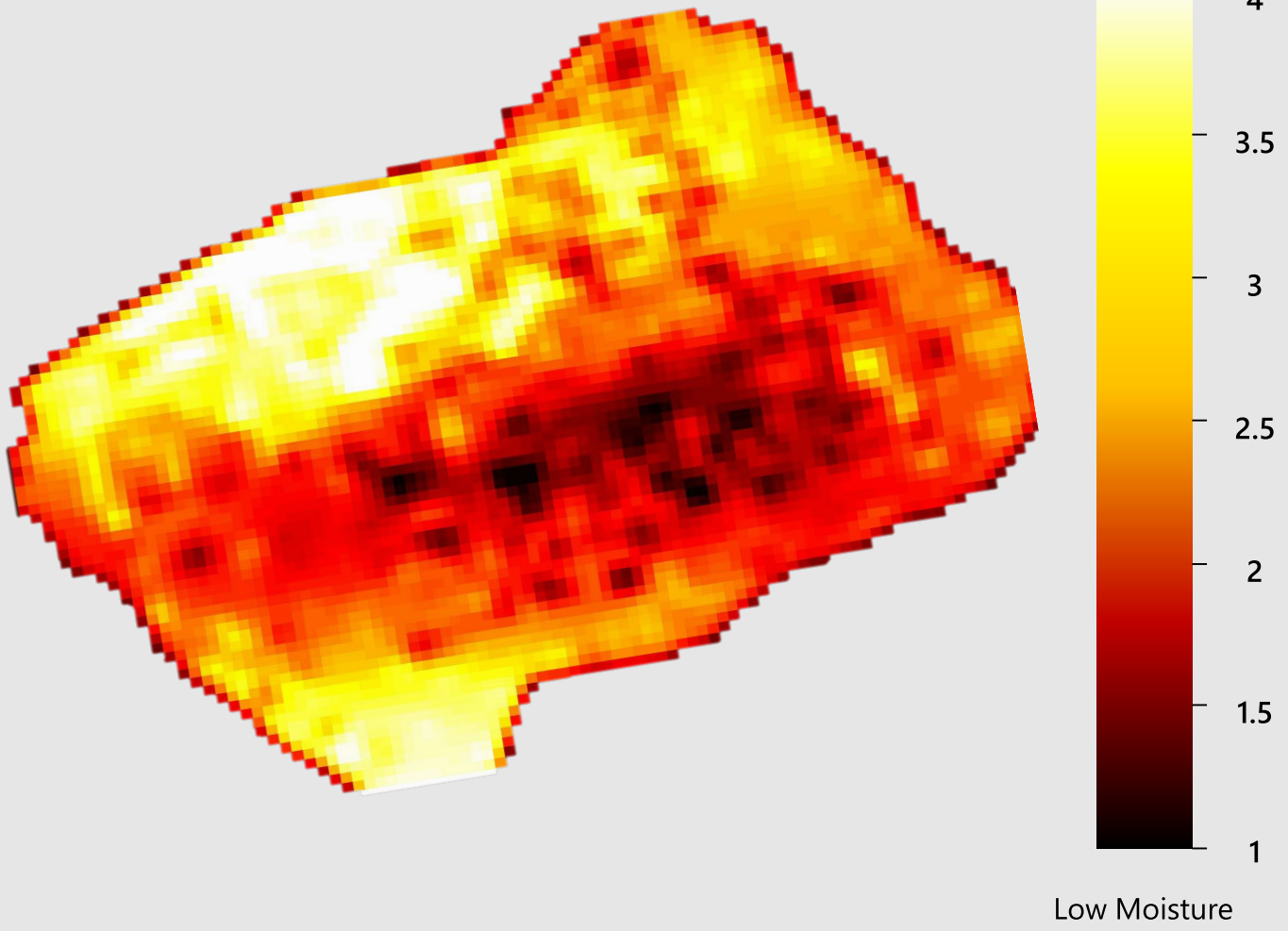


Idea: Use Drones to Enhance Spatial Coverage



Precision Map : Moisture

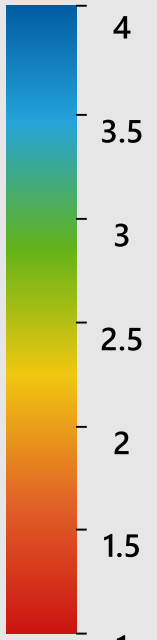




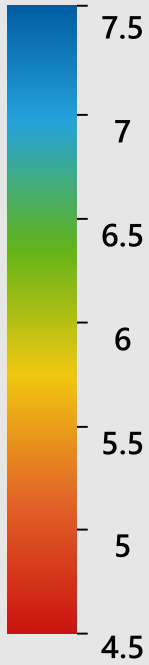
Idea: use drones/balloons to enhance spatial coverage

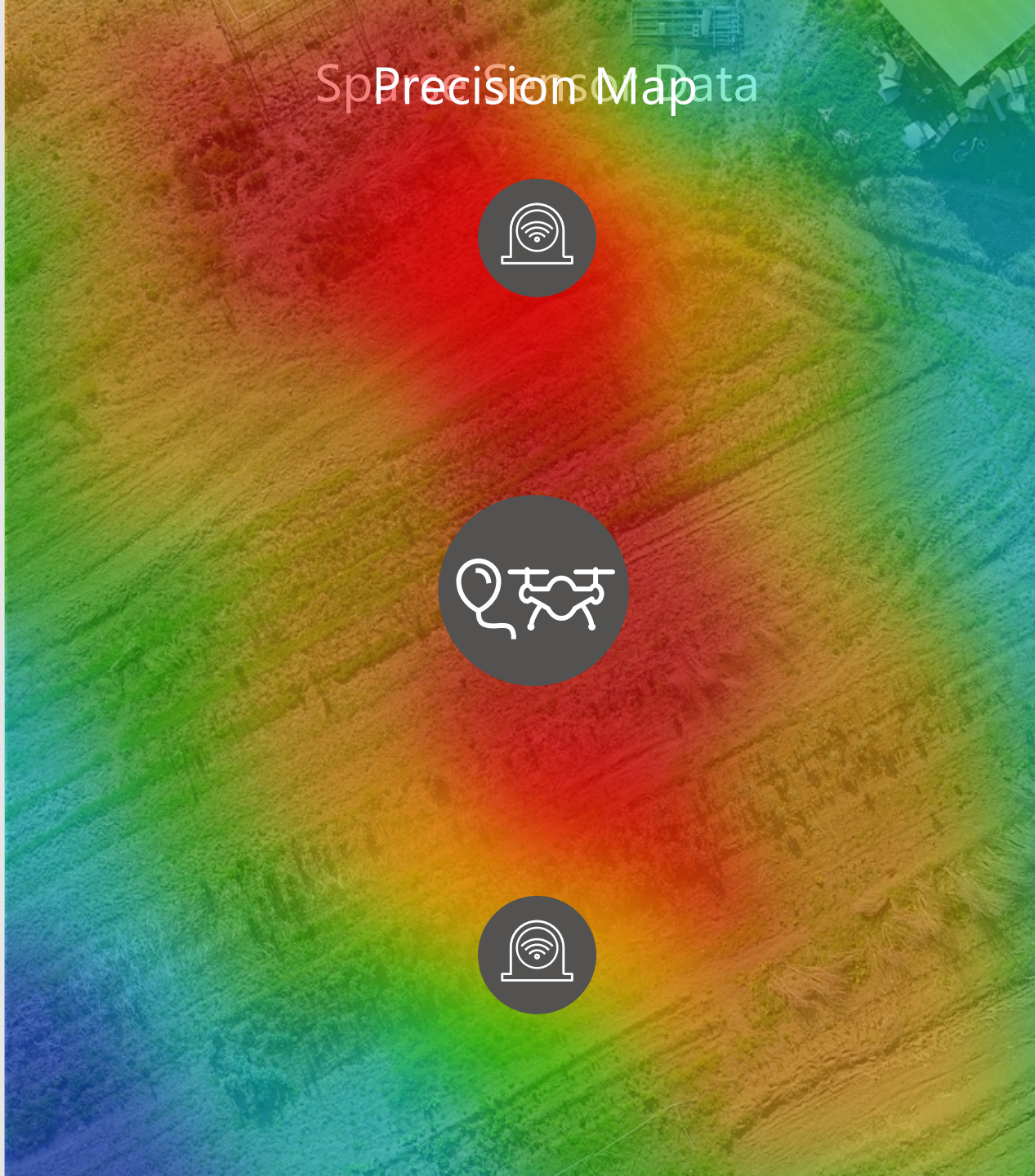
FarmBeats can use drones to expand the sparse sensor data and create summaries for the farm

Precision Map:
Moisture



Precision Map:
pH





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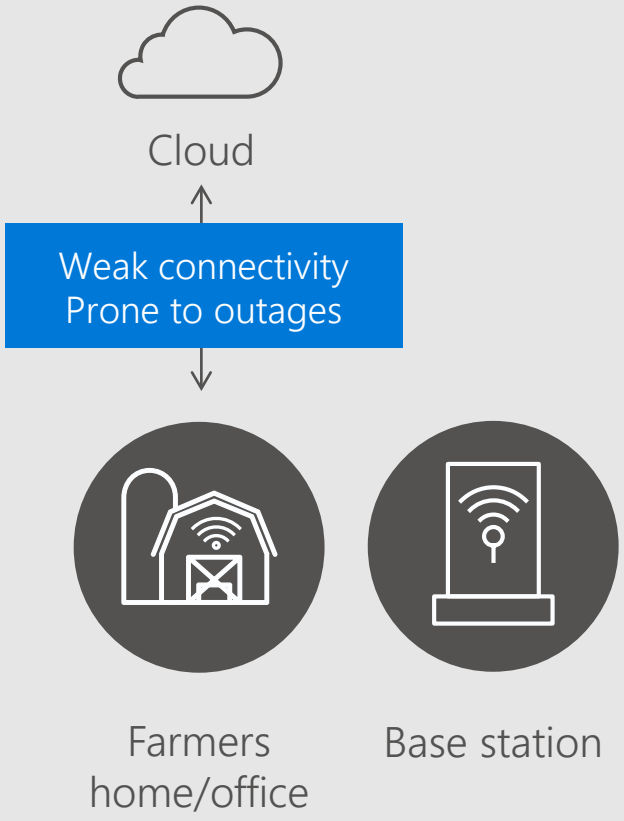
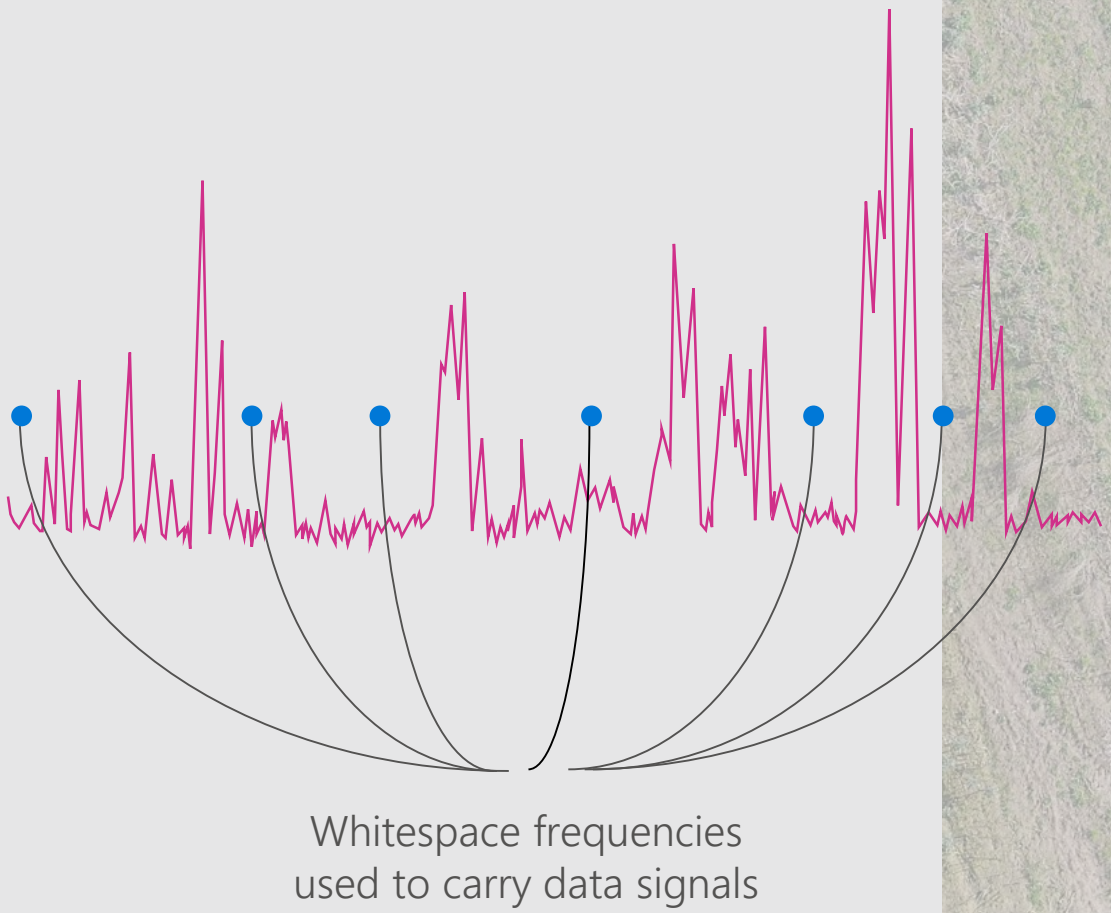
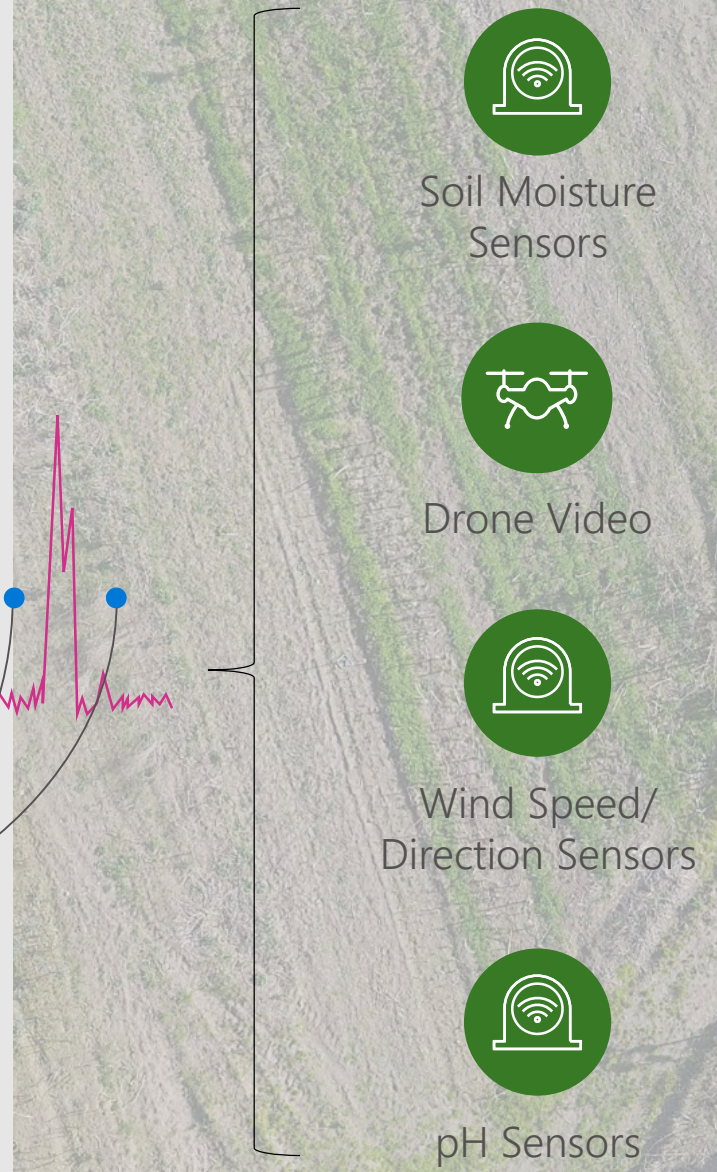
The Real World







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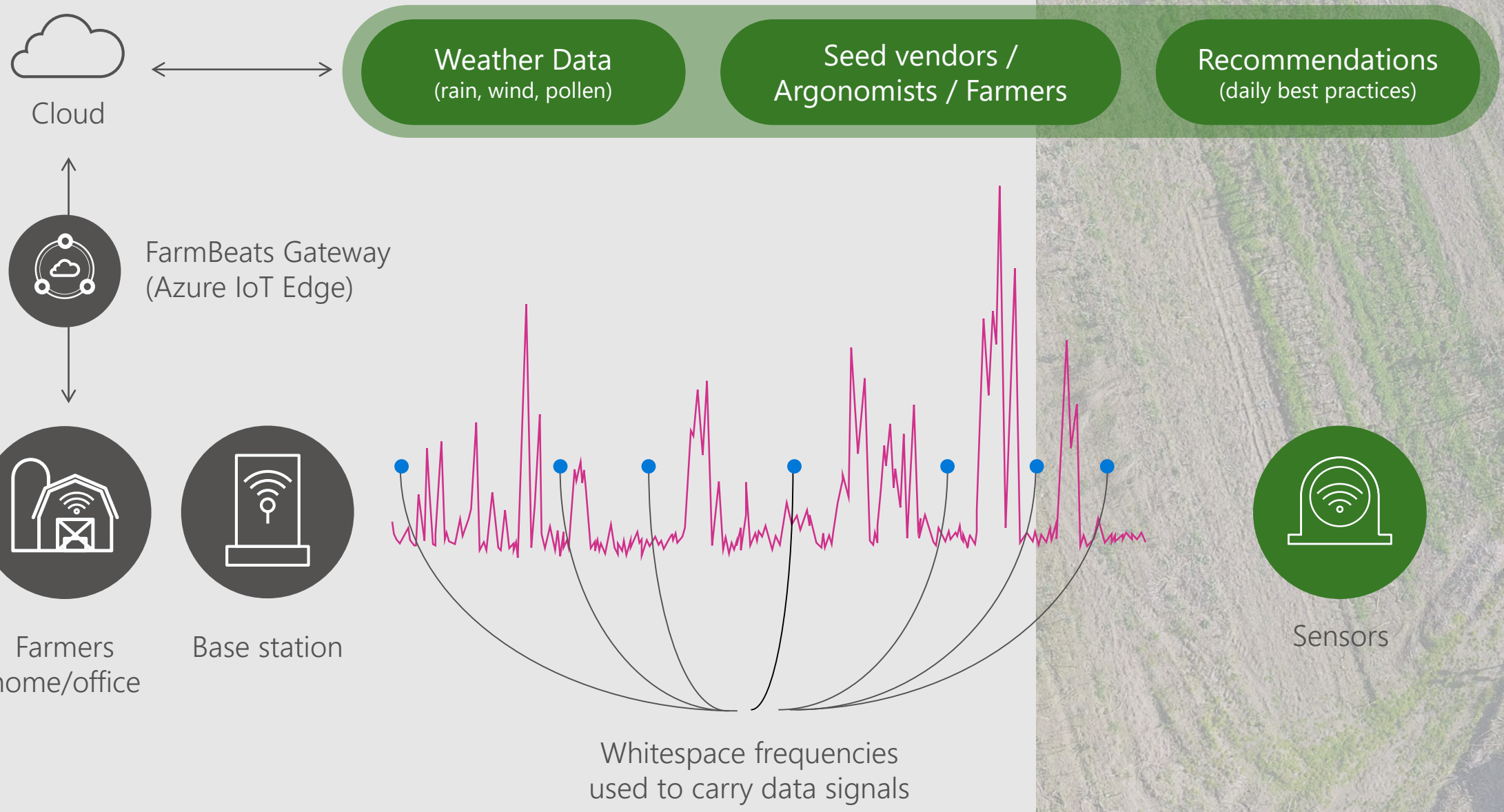
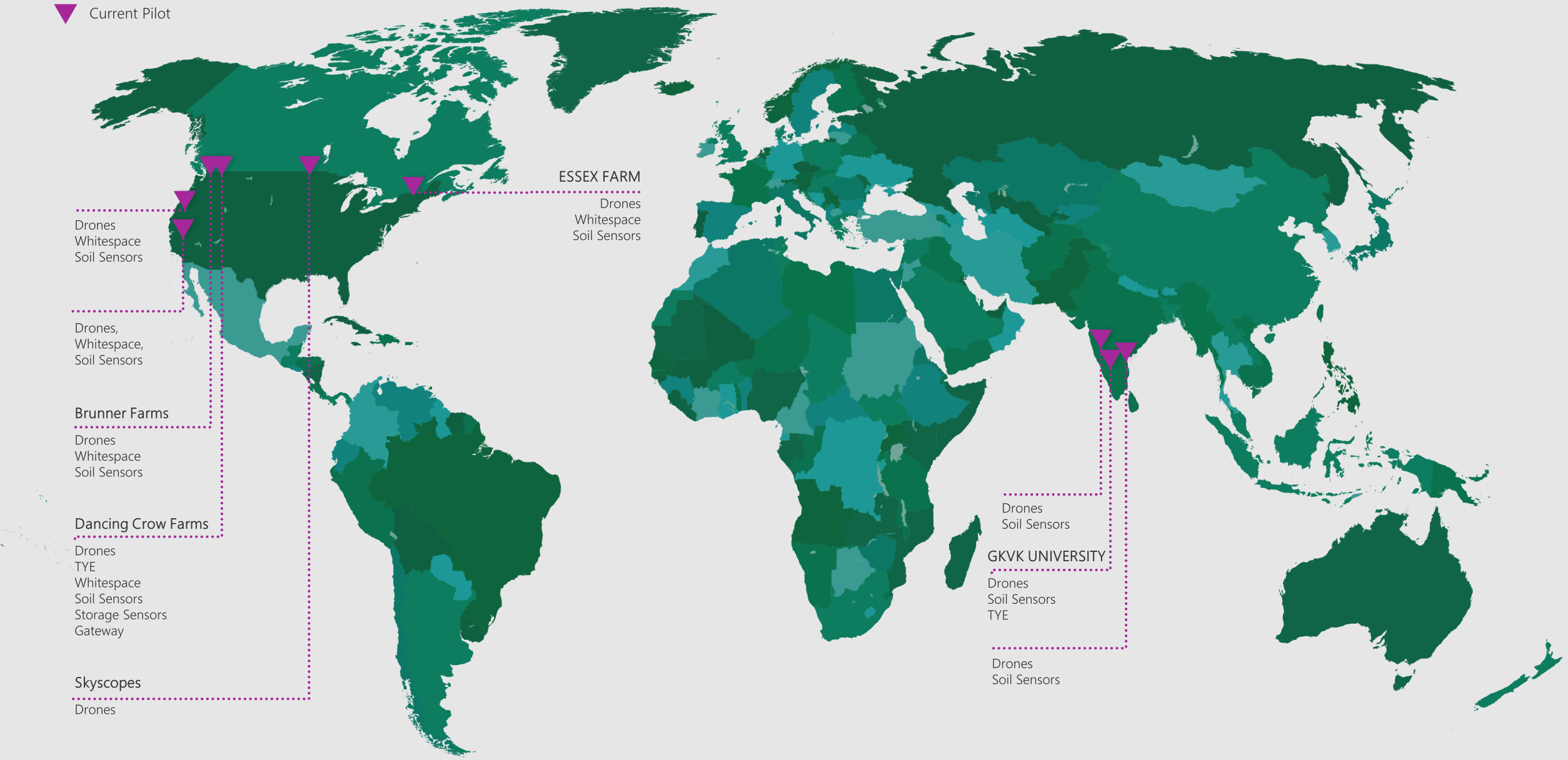


Pilot Project Status




Sample Data Vizualization
Sample ML/AI Models
Connected Cows
Precision Farming
Smart Equipment
Device Management
Databricks
Power BI
ML/AI
FarmBeats Accelerator
ISV/Partner Solutions
IoT Hub
FarmBeats Datahub
Data Store
Weather
Satellite
Gateway
IoT Edge
TV White Space
Sensor
Node
Drone
ISV/Partner
FarmBeats
Azure
Microsoft