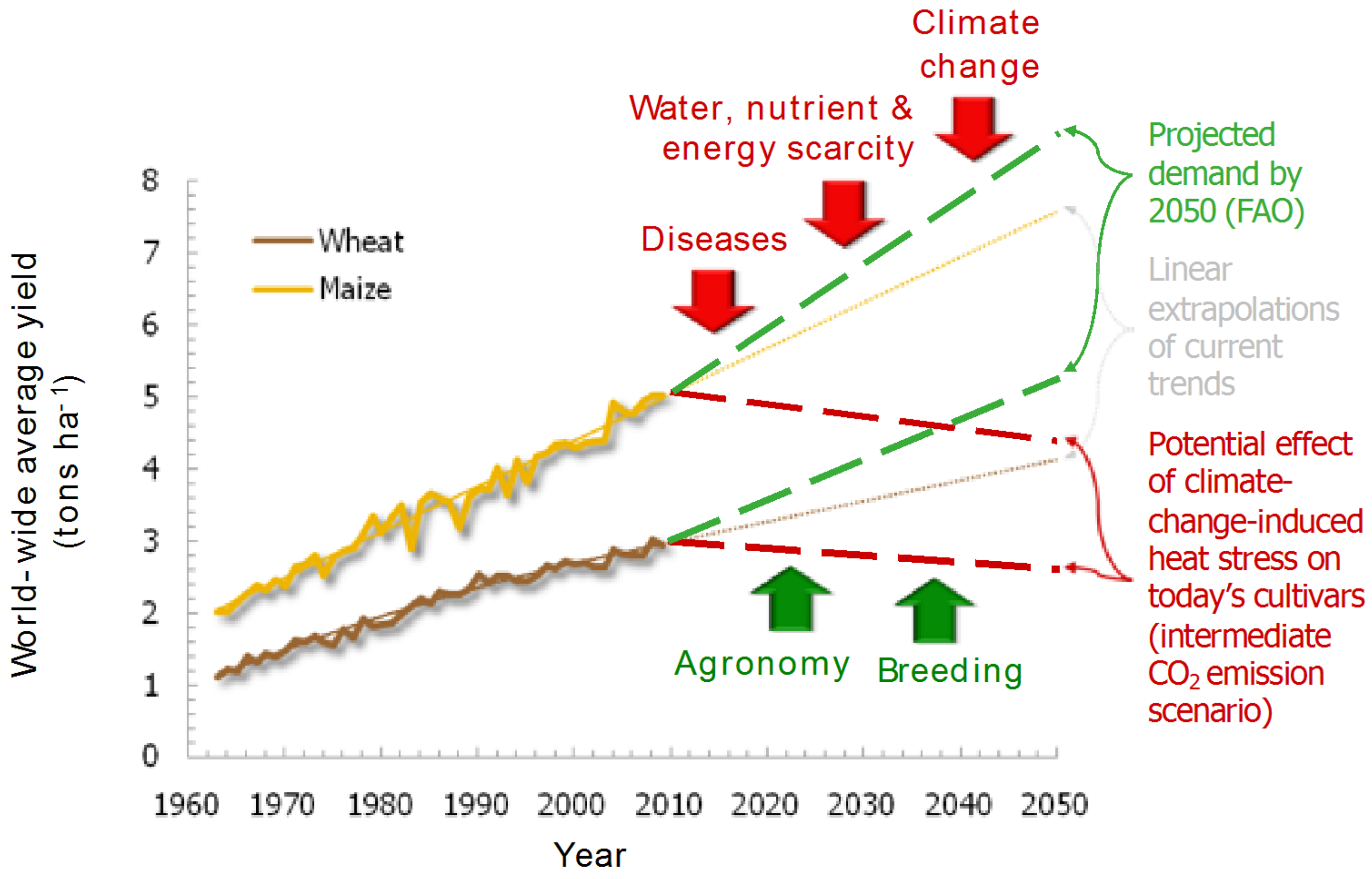
The Modern African Farmer Supported by DigiFarm

Real-time observed weather for data-driven agriculture, investments and policies to deliver ***Economic Resilience to Climate Change***

DavidBergvinson@aWhere.com

PRESENTED AT MERCY CORPS AGRIFIN ACCELERATE 4TH ANNUAL LEARNING EVENT

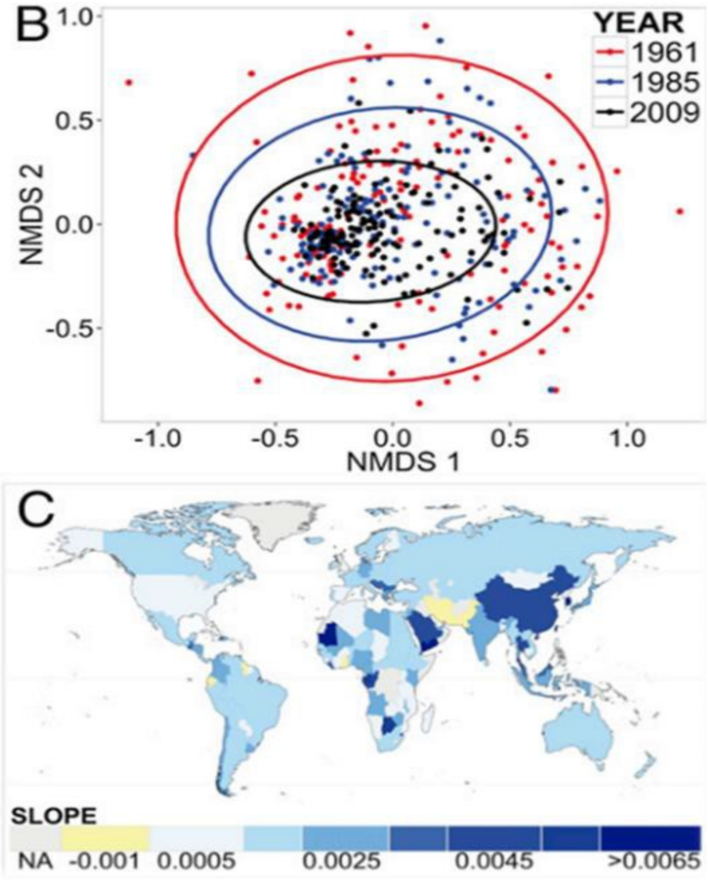
Setting the Stage



Nutritional Security is threatened by:

- Climate change
- Resource scarcity
- Changing demographics

Setting the Stage



Khoury et al. (2014) PNAS 111:4001-4006

Climate change, resource scarcity and changing demographics threaten nutritional security

For nutritional security to be realized:

- Genetic gains +50%
- Cropping systems enhanced
- Diet diversity to be increased
- Risk and economic opportunities managed

We need to realize gains with same land, less water, nutrients, fossil fuels and labour

All of this needs to be done against the backdrop of climate change.

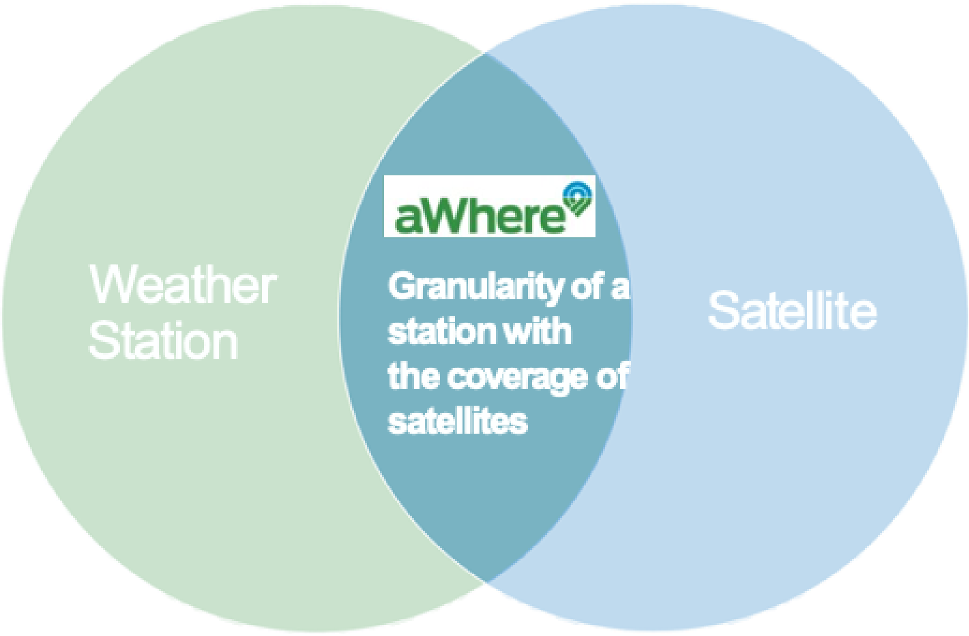
aWhere is making a difference

aWhere is a key implementation partner to de-risk agriculture and provide insights to all segments of the agriculture value chain and adjacent sectors

We believe that weather drives agriculture, and weather content drives decisions in modern agriculture to deliver profitability and resilience to farmers and safe, nutritious food for consumers.

Power of aWhere weather data

Combining the granularity of weather stations with the coverage of satellites to empower farmers, scientists, industry, and policy makers adapt to Climate Change



Types of Questions:

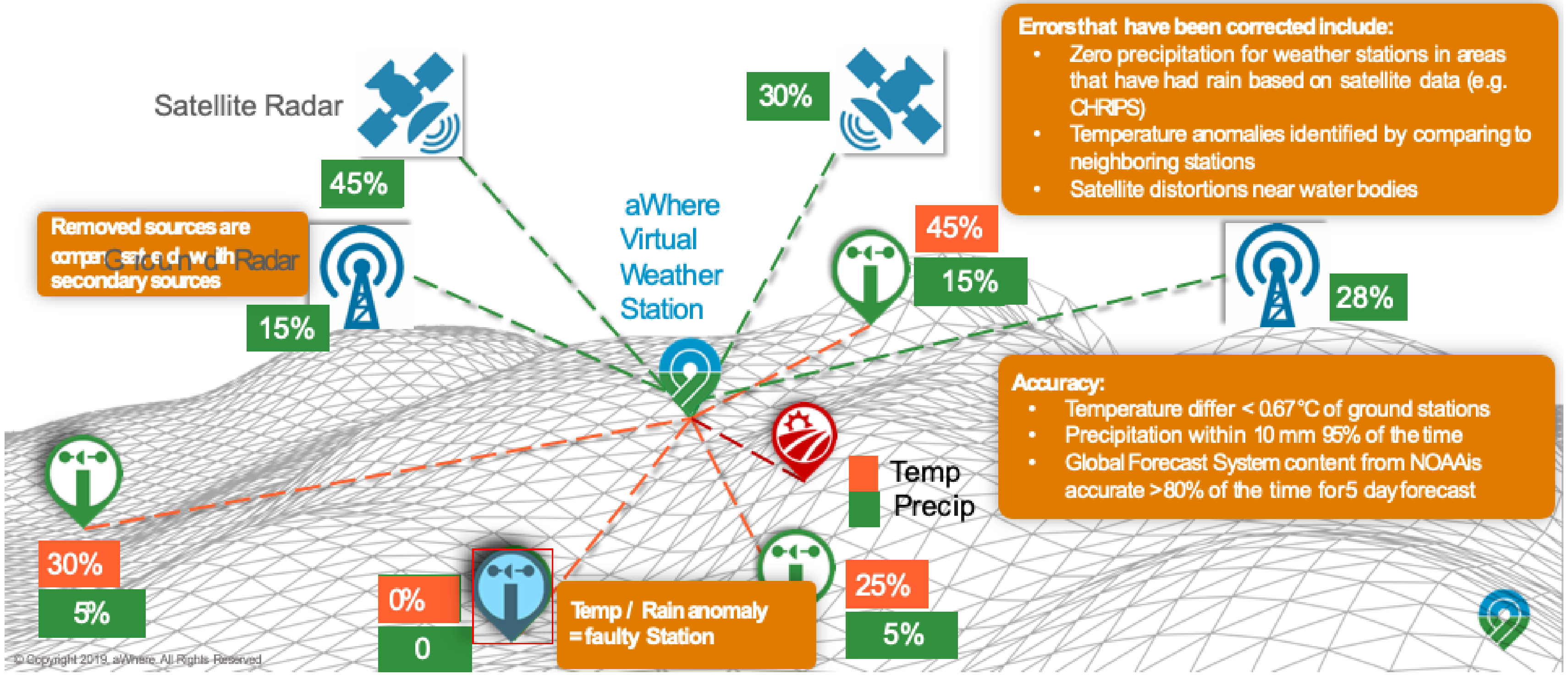
- How much seed of a given variety *or* fertilizer do I need this season?
- Estimated production, *or* number of people affected by drought over a defined area of interest?

These types of questions are best addressed with **contiguous weather surfaces** that reflect local weather variability

Data Quality and Accuracy

Three stages of quality control and Validation:

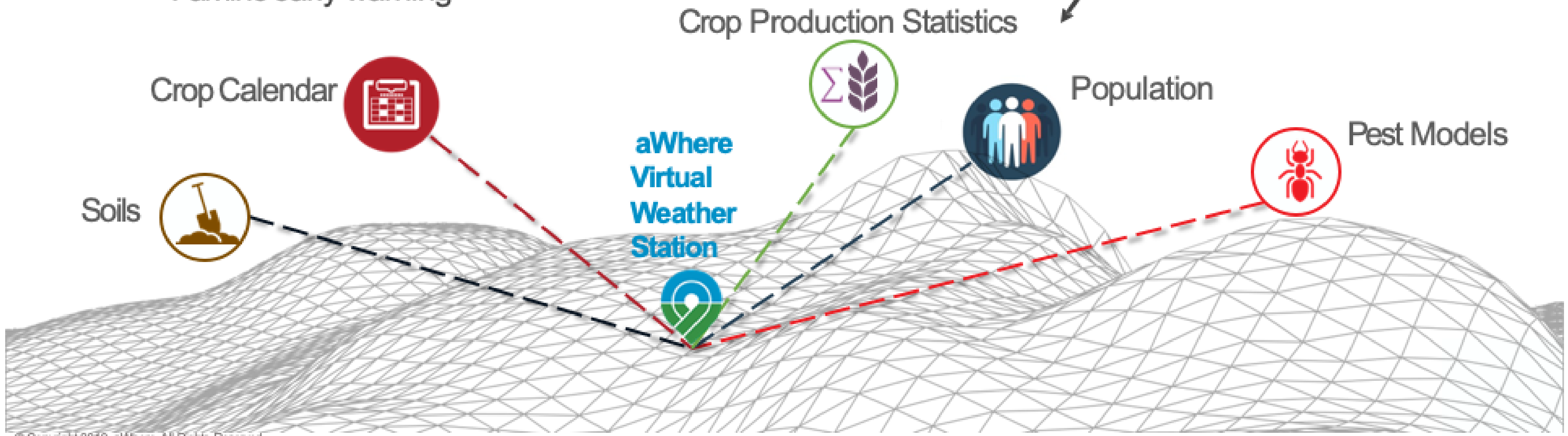
1. Contracted providers do quality checks for forecasts, weather stations, and satellite derived products.
2. aWhere compares station and satellite data using its virtual stations to identify faulty stations that are removed.
3. Client feedback from the field for over a decade – around the world.



Power of Advanced Weather Products and Insights

- Environmental Trend Analysis
- Site Similarity and Crop Suitability
- Pest and Disease Prediction
- Irrigation Management
- Identify Environmental Anomalies (droughts, floods, heat stress)
- Planting and Fertilizer Recommendations (timing)
- Famine early warning

Easily integrate external datasets for analysis



Science@Scale

Geoinformatics to connect where and when to prioritize and taret science outputs to empower farmers and deliver sustainable nutrition and food security

People + Location + Weather -> Research Priorities

Local Requirements + Weather -> Research Products

G x M x E x P + Weather -> Production

Market + Inventory + Weather -> Pricing Volatility

Food Affordability + Weather -> Risk (Food Security)

Food Insecurity + Weather -> Conflict

- Agriculture is a weather-driven industry that is more variable now due to Climate Change

- Research Outputs + Observed Weather Data can target the delivery of Science@Scale

Setting the Stage

Current realities in developing countries

Smallholder farmers in Africa have little access to inputs, information and services to increase productivity and access equitable markets – this is even more challenging for woman farmers

Over 7 billion mobile phones are in use with greatest growth occurring in developing countries. TelCos are expanding rapidly in rural areas within developing countries by offer value added services

ICT Tools are Being Used

Cloud-based business intelligence tools are now used to accelerate delivery of farmer preferred technologies

Challenges:

- Valuation of farm data
- Literacy and UI to support knowledgable exchange and decisions at farm level
- Personal Identification Information
- Big Data Governance
- Reliable and affordable connectivity in rural areas
- Lack of high quality GIS data
- Spatial Data Infrastructure is weak
- Capacity building

Public + Private Sector

This is happening, there are ways and approaches to overcoming the challenges of partnership

- Philanthropic division
- Companies with a social mission (USA B-corp)
- Subcontractors and sub-grantees within grants and contracts
- Upfront conversations on non-negotiable terms
- Rallying behind quantitative and "objective" metrics toward shared goals across public, private and producers

Combine the strengths of the public sector and the strengths of the private sector

PPPs are Challenging

Fortunately, the benefits far outweigh the costs and challenges

- Shared vision of success – up front
- Trust among partners – earned over time
- Win-Win-Win partnerships – equitable benefits across parties
- Enabling policy environment – equitable access to inputs, services and markets; PPPPs speak with one voice to change policies
- Capacity building of partners – empower entrepreneurs (esp. women and youth) for success in ag services and value addition
- Data governance – govern big data to protect PII but unlock potential to target technology and know your customer
- Awareness of key issues – nutrition, health, ecological limits, equity; SDGs can drive behavior change towards PPPPs.

Farmer's Perspective of a Cropping Season

The more accurate and timelier the input, the more valuable the recommendation is to farmers – *everyone wins when the farmer wins*

Cropping sequence:

- What to plant (based on agroecology, historical weather, market price, credit for inputs)
- How to prepare for planting (tillage practice, past inputs, access to machinery)
- When to plant (trigger to plant based on soil type, weather forecast forecast)
- Good Agronomic Practices (GAP) during different crop stages (when and amount of fertilizer to apply, pest and disease control interventions, weeding operations and water conservation practices, and other practices to enhance farm profitability)
- Optimal harvest time (based on maturity class/variety and date of planting) - minimize post-harvest losses and preserve quality; aggregator knows when and where produce is available
- Market integration to increase value chain efficiency
- Access to data-validated credit and weather-indexed insurance products (closing the loop).

Science@Scale

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Leesa Shrader
Program Director,
AgriFin Accelerate Program
lshrader@mercycorps.org

In collaboration with:

David Bergvinson
Chief Science Officer,
DavidBergvinson@aWhere.com

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