Next Generation Use Cases of Satellite Data for Agriculture

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Lake Okeechobee, Florida, USA – July 1, 2016
Introduction

Agenda

01 | Satellite Constellations
02 | Why Additional Data Matters
03 | Traditional Use Cases for Remote Sensing Data
04 | Evolution of Use Cases
05 | Why Are We Still Talking About Satellite Data?

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Earth Observing Satellite Comparisons (*2017)
Why Does Additional Data Matter?

- Planter data
- Soil moisture
- Satellite data
- Fertilizer application
- Drone data
- Harvest data
Common Use Cases for Satellite Imagery

- Delineating Management Zones
- Variable-Rate Applications
- Field Monitoring
Delineating Management Zones

Average annual productivity showing historical in-field variations of field output.

Management Zones - Average output

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Variable-Rate Applications
Field Monitoring and Directed Scouting

- Insect Damage
- Poor Stand

Planetscope SAVI @ 3 Meter Spatial Resolution

Cocklebur Infestation

Disease Pressure

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Additional Proposed Use Cases

- Extracting Field Boundaries
- Fusion Data
- Tracking Crop Phenology
- Estimating Biomass
- Improving Yield Estimation
- Identifying Planting and Harvest Dates
- Monitoring Best Management Practices
- Understanding Crop Nitrogen Status
- Improving Forage Use Efficiency
FIELD BOUNDARY EXTRACTION

Machine Learning based Object Detection
Fusion Data harnesses multiple sensors to produce a unified, and stable stream of data.

**Fusion Data**

- Uninterrupted,
  Cloud- and Gap-free

- Radiometrically Accurate
  & Consistent

- Optimized for
  Quantitative Workflows
Tracking Crop Phenology

US-Ne3 2019

Rainfed corn

*Phenology and in-situ LAI data provided by University of Nebraska-Lincoln

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Changes in flowering timing and density tracked by the EBI should improve our understanding and prediction of flower and pollination response to weather and ultimately yield.
Estimating Biomass
Identifying Planting and Harvest Dates

Sadeh et al. (2019)

Sowing date detection at the field scale using PlanetScope remote sensing when no till is practiced.
Monitoring best agricultural practices
Who is going to take satellite data to the next level?
Effectively leveraging satellite data is challenging

- Image Fatigue
- Large Data Sets
- Low adoption
- Deriving insights is time consuming
- Lack of expertise or dedicated resources
- Technology utilization is relatively new
- Struggle to make solutions economically profitable
Embrace change and discover the power of Global Connection.

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