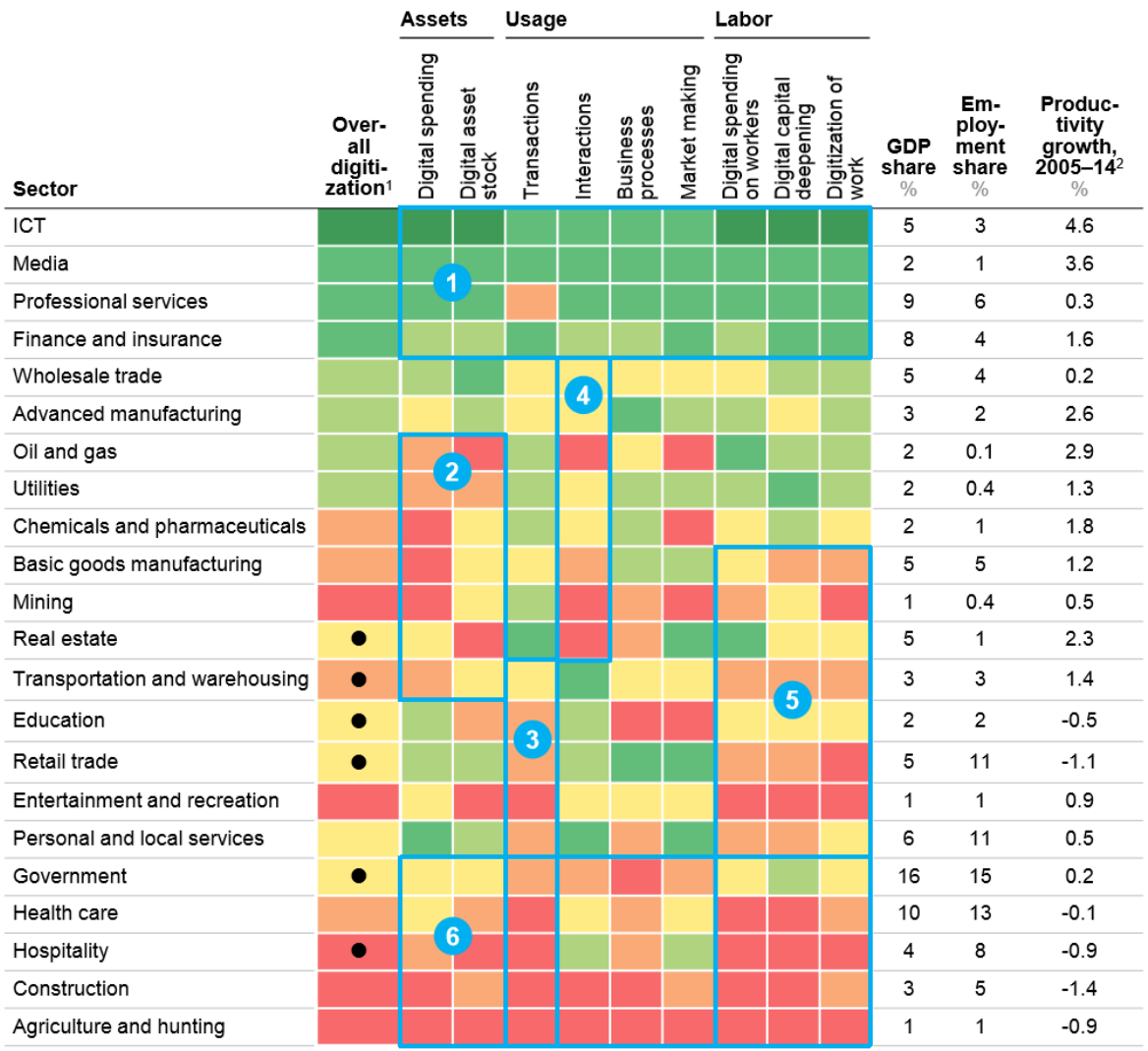
Big Data/Modern Analytic Techniques

Presentation to Crawford Fund 2017 Annual Conference

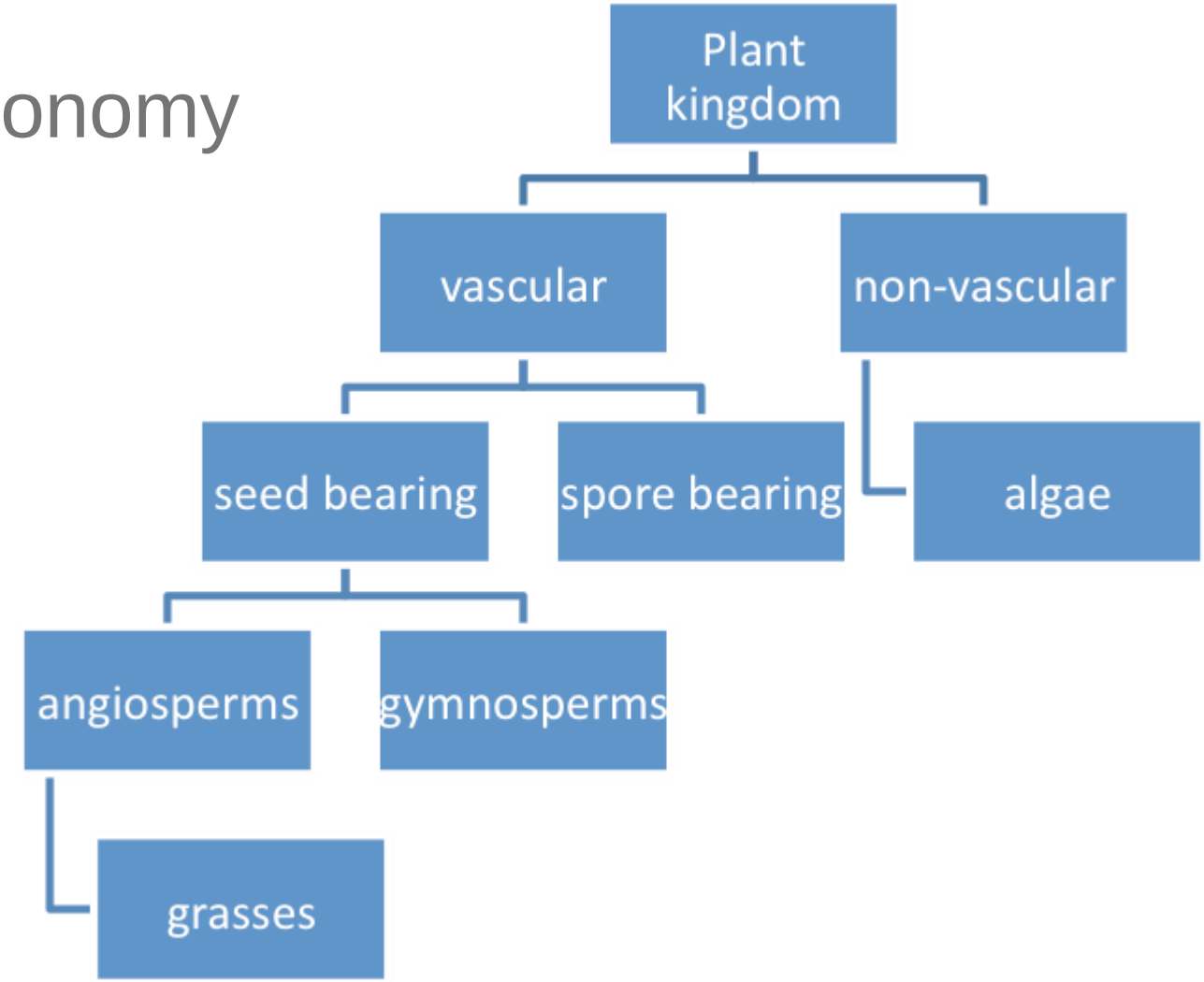
Steve Mathews

8 AUGUST 2017 - CANBERRA

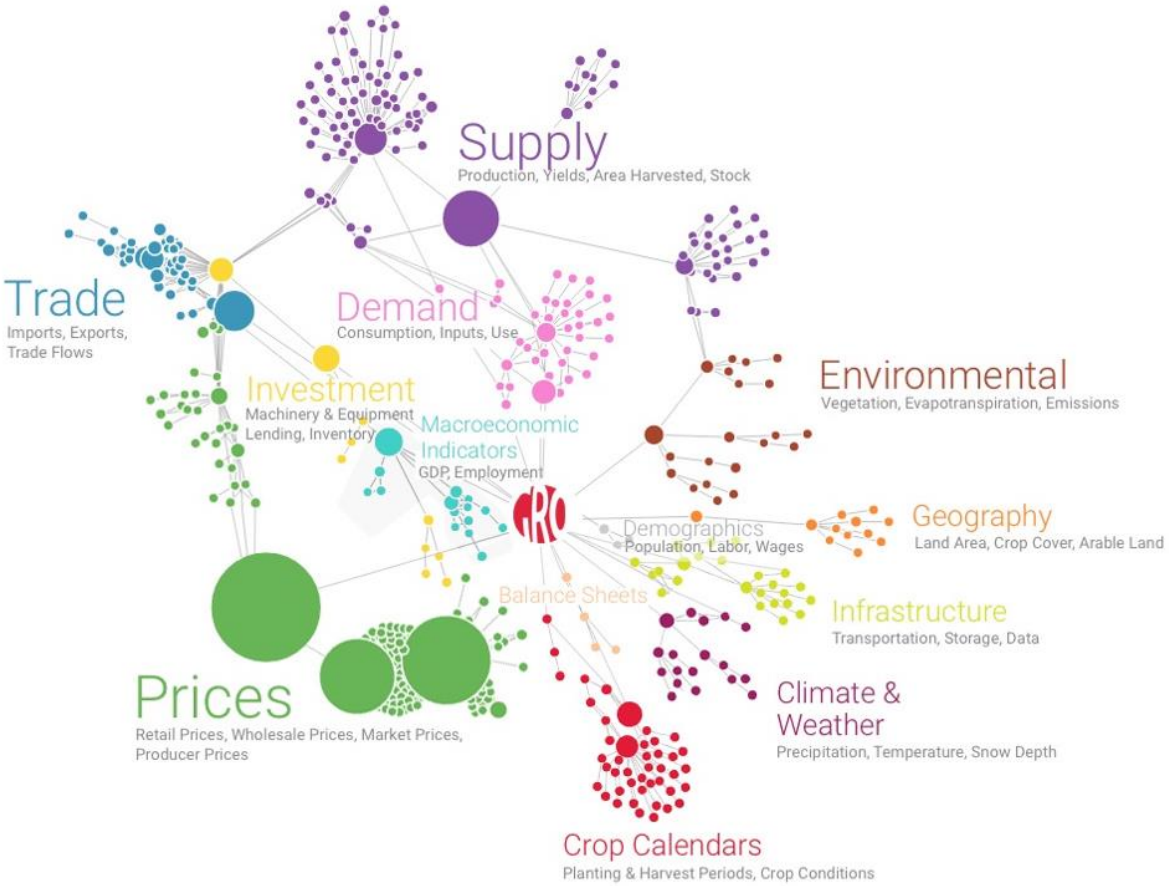
McKinsey Global Institute Digitization Index



Taxonomy

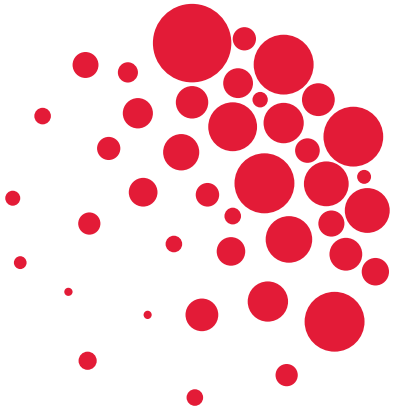

Plant kingdom
vascular
non-vascular
seed bearing
spore bearing
algae
angiosperms
gymnosperms
grasses

Gro's Proprietary Ontology



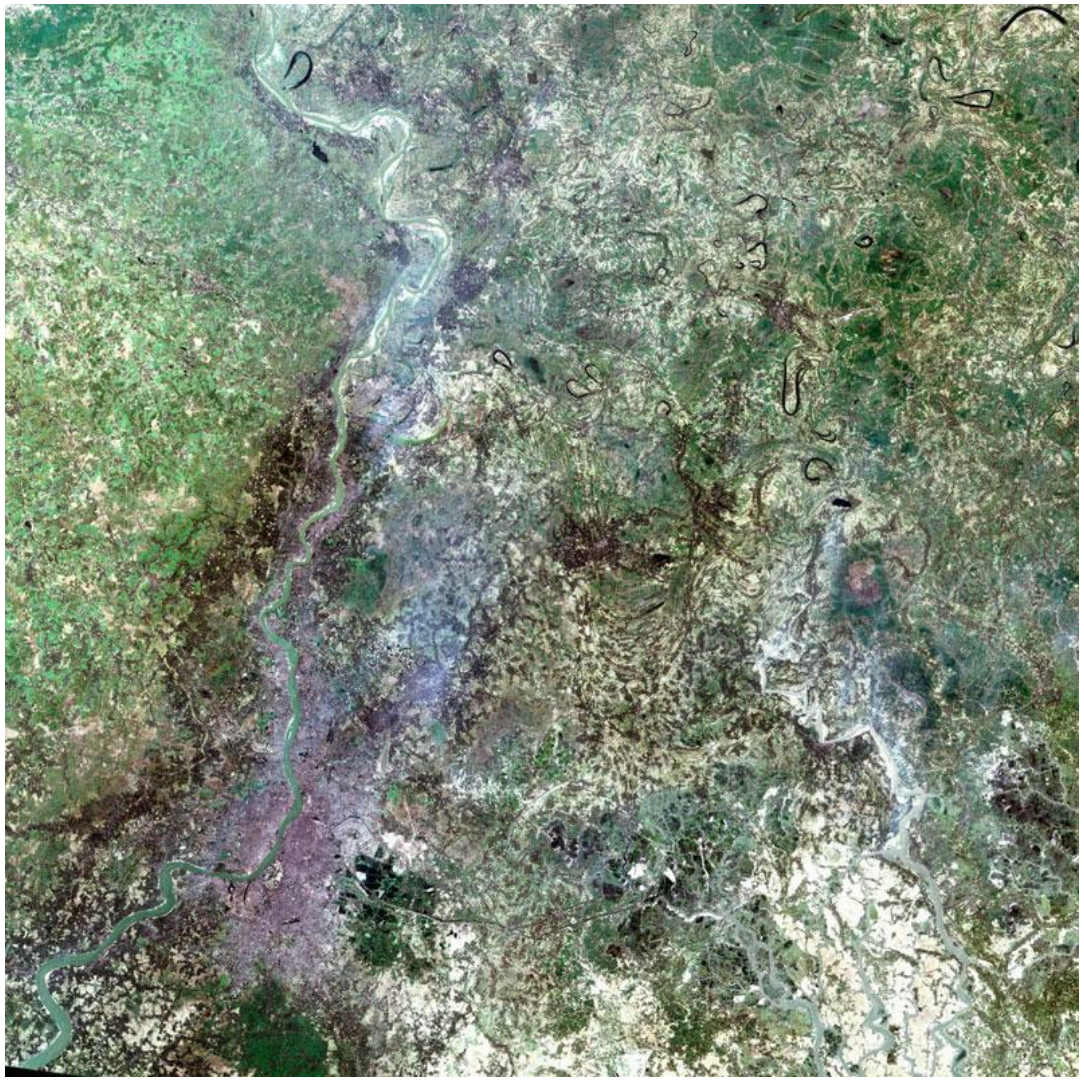
The Problem

Lack of normalized, reliable, and real-time information makes agricultural markets inefficient and risk management difficult.

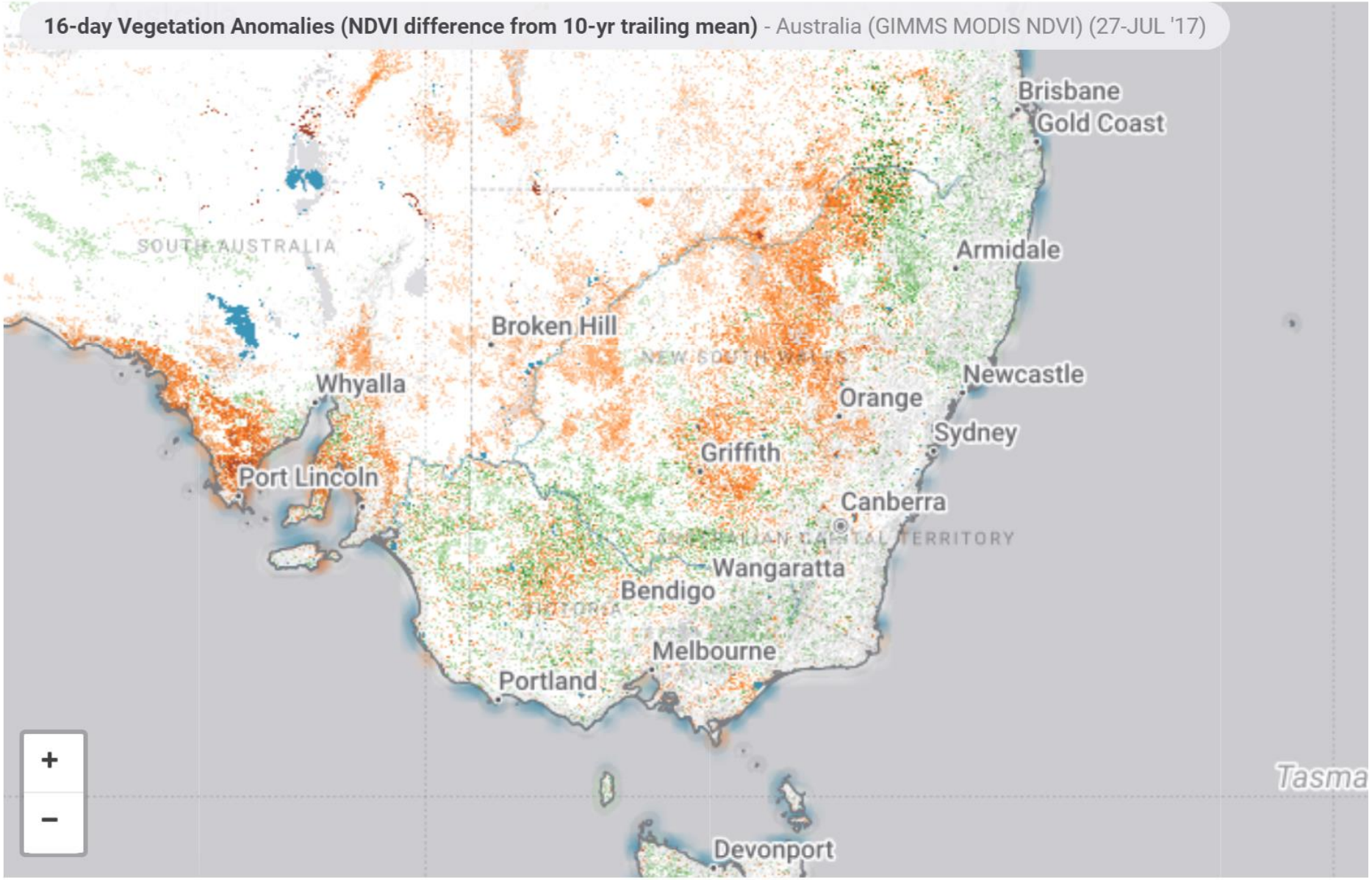


Agriculture market participants suffer from significant amounts of information asymmetry.

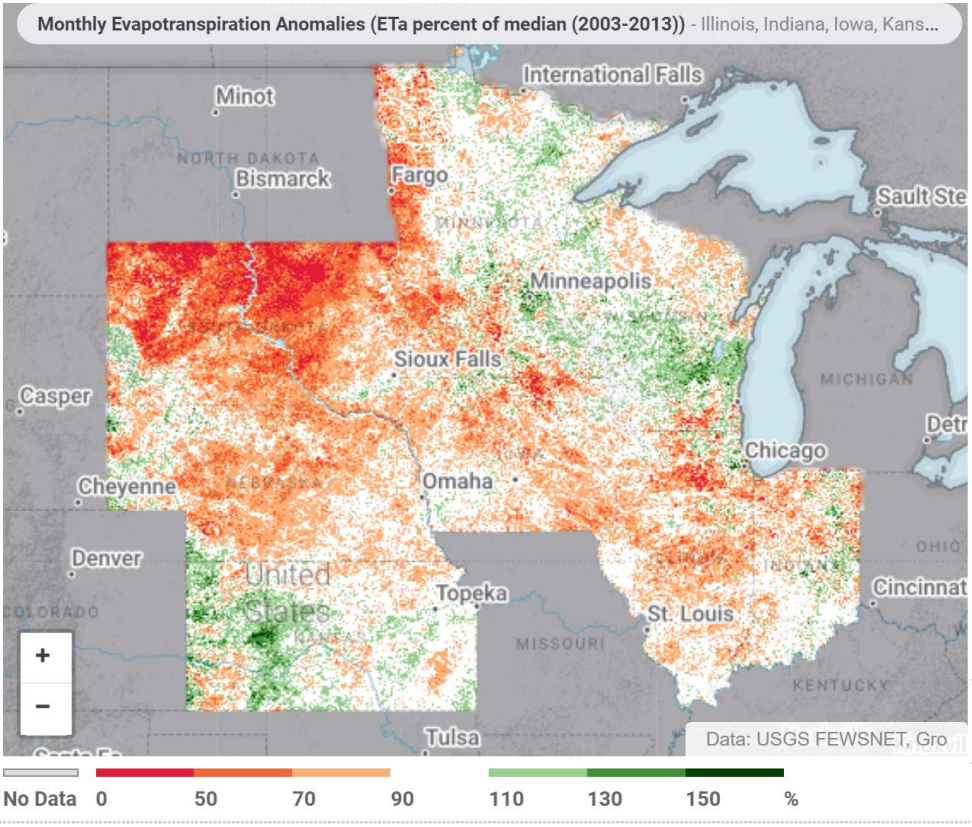
There is no common language that the industry uses to understand and analyze all data related to agriculture.

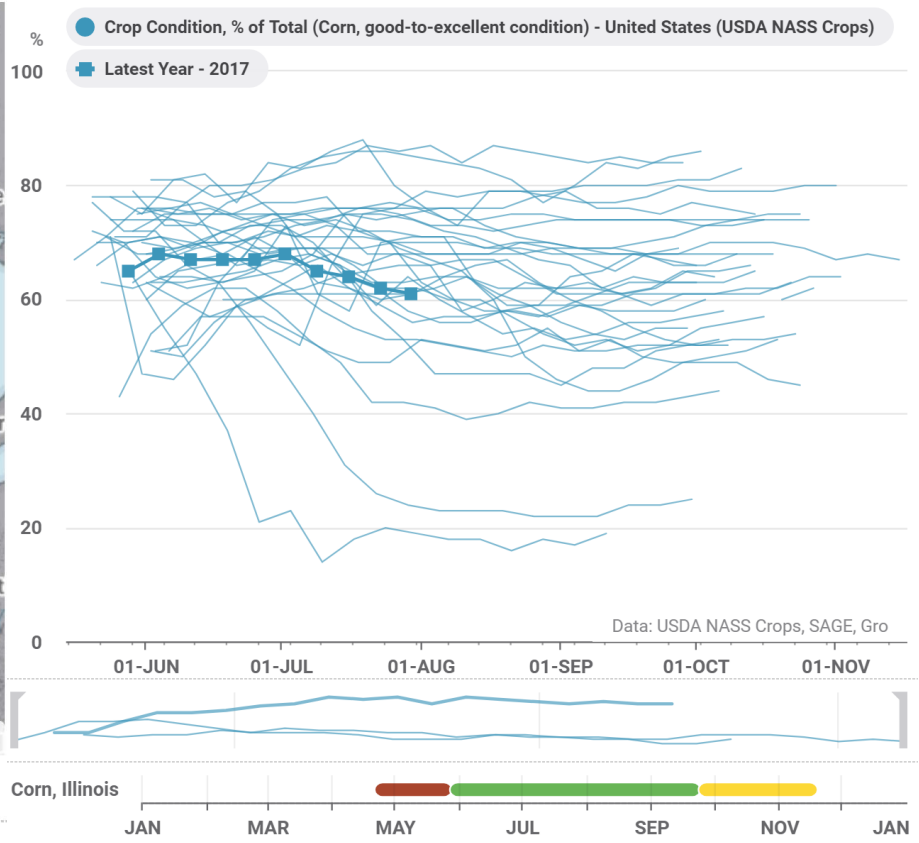


By NASA - Outta Space, Public Domain, https://commons.wikimedia.org/w/index.php?curid=300628

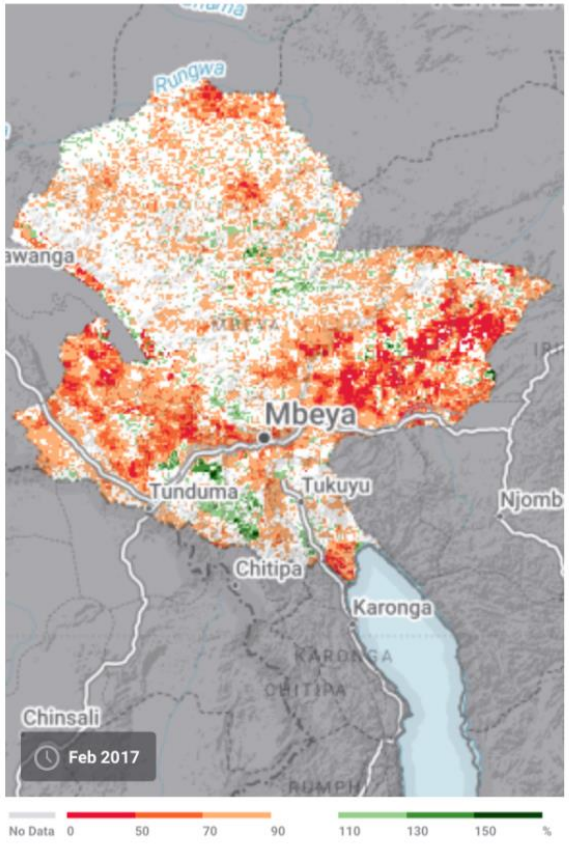

16-day Vegetation Anomalies (NDVI difference from 10-yr trailing mean) - Australia (GIMMS MODIS NDVI) (27-JUL '17)
Brisbane
Gold Coast
SOUTH AUSTRALIA
Armidale
Broken Hill
NEW SOUTH WALES
Whyalla
Newcastle
Orange
Sydney
Griffith
Port Lincoln
Canberra
AUSTRALIAN CAPITAL TERRITORY
Wangaratta
Bendigo
VICTORIA
Melbourne
Portland
Tasma
Devonport
+
−
No Data -1 -0.5 -0.4 -0.3 -0.2 -0.1 -0.05 0.05 0.1 0.2 0.3 0.4 0.5 1 index

Satellite Pictures to Actionable Indices

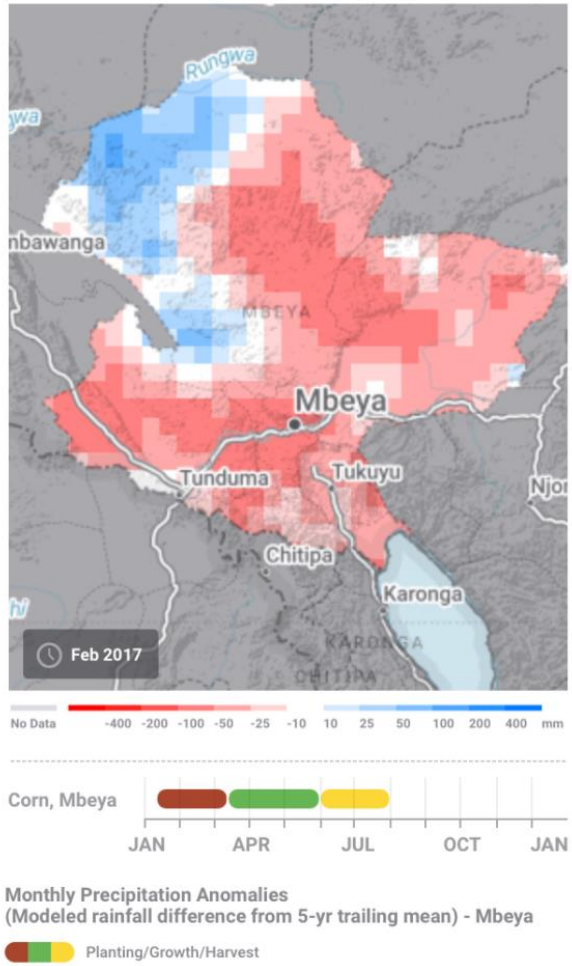




Mbeya, Kenya: 2017 Drought



Monthly Evapotranspiration Anomalies
(ETa percent of median (2003-2013)) - Mbeya



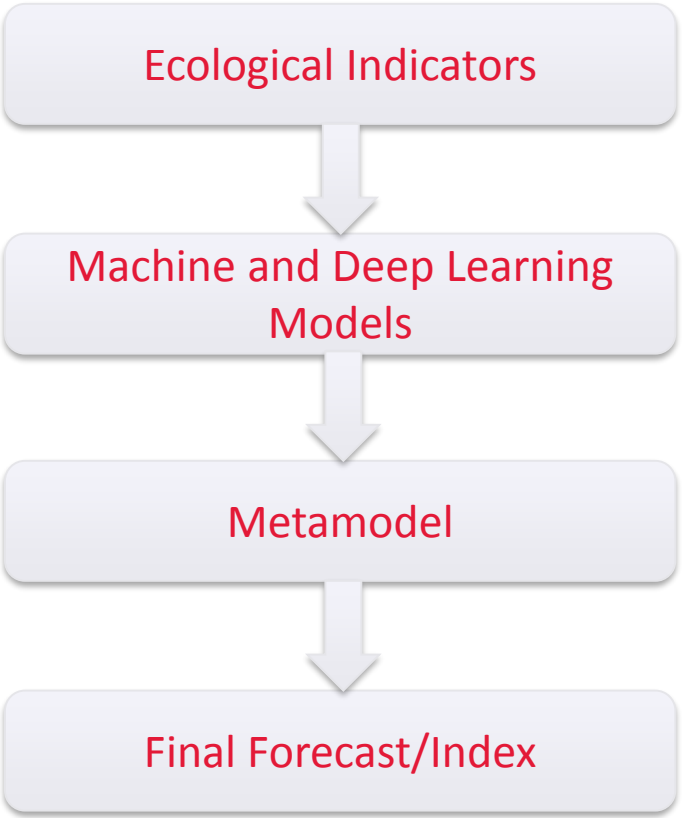
Monthly Precipitation Anomalies
(Modeled rainfall difference from 5-yr trailing mean) - Mbeya

Planting/Growth/Harvest

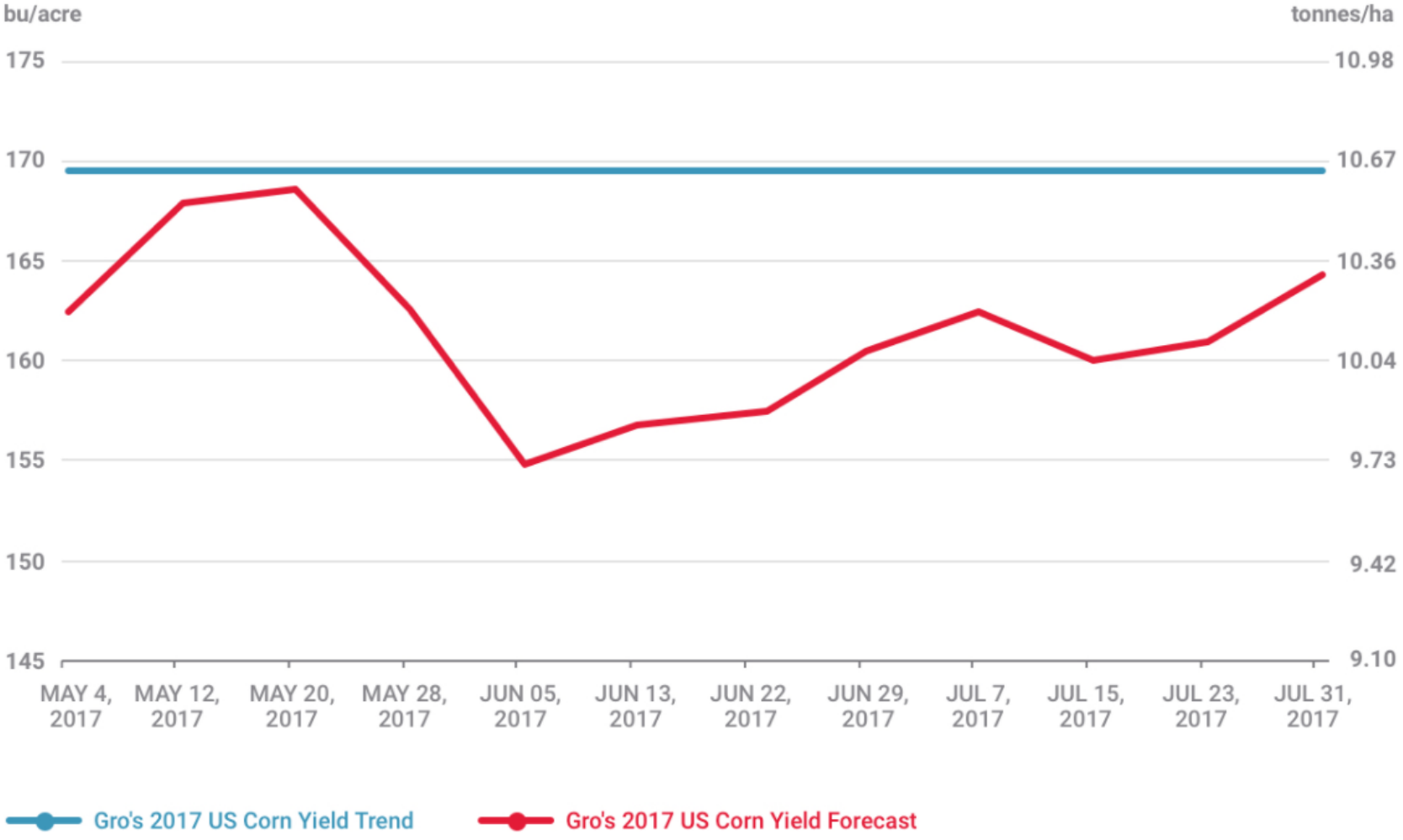
Data: NOAA CPC, SAGE, USGS FEWSNET, Gro Intelligence

www.gro-intelligence.com

Yield Forecast and Drought Index Approach



Gro's 2017 US Corn Yield Forecast Breaks Higher



Data: USDA NASS Crops, Gro Intelligence Yield Model

www.gro-intelligence.com

Sub Saharan Africa Data Wishlist

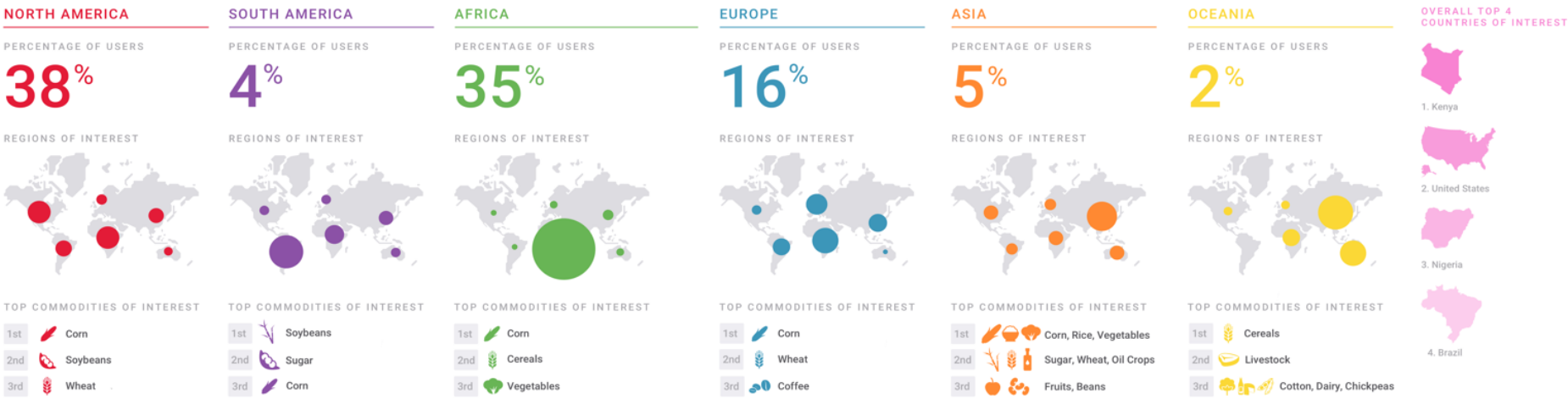
Sample of data categories we believe would be critical to collect for African countries at a more frequent and granular level

Agronomy	Production	Supply	Use	Prices	Economics
Ag equipment in use (c)	Seed production (a)	Imports (m)	Upstream - Oilseed processing (m)	Inputs - fertilizers (a)	Land rent/water rights (a)
Fertilizer use per acre (a)	Acres Planted - County (a)	Stocks - Province/State level (q)	By type - maize, cornmeal (a)	Ag labor rates (a)	Total Input Costs (m)
Pesticide use per acre (a)	Acres Harvested - County (a)	Stocks by type - grain, silage (q)	By use - seed, food, industrial (a)	Farm-gate (w)	Producer Margin-by crop (a)
GMO seed use (a)	Yield - County (a)	Grain-Cold storage capacity (a)	Per-capita consumption (a)	Export prices (m)	Avg. farm size (c)
Soil conditions (a)	Crop Progress Reports (m)	Grain shipments-deliveries (q)	Domestic govt. tenders (w)	Domestic freight rates (m)	Avg. farm income (a)
Fallowed acres (a)	Harvest grading - ergot levels (a)	Grain handling capacity - port level (a)	Exports (m)	Byproducts - wholesale (d)	Avg. farm debt (a)
Irrigated acres (a)	Byproduct - meat, feed (m)	Obsolescence-Loss Rates - (a)	Retail expenditures (m)	Processed - retail (d)	Storage, insurance rates (m)

Frequency Code: C-census, A-annual, M-monthly , W-weekly, and D-daily.
Blue items may not be applicable to USDA reports.

User Survey

Where are you located and what are you interested in?



If you could have a 'dream data dashboard', what would it monitor?

What commodity groups are you interested in?

What are you expecting to get out of Clews?

- 71% Education
- 68% Fact checking/ cross-referencing
- 60% Saving time/ optimizing current analysis practices
- 7% Other

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Sources: Gro Intelligence Sample Survey Oct. 12, 2016

Credit/Insurance

Lowering the cost of capital and expanding access to credit is critical

Better credit models can be developed by incorporating “market risk” data into the models.

- Variables well beyond existing credit history of borrower are data series that are available in Gro
  - Growing Cycles
  - Climate and growing conditions
  - Perils (fire, flood, infestations, predation)
  - Price of crop
  - Price of other commodities
  - National and regional programs and restrictions
  - Trade policies

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