Using satellite data to improve index insurance: Lessons from the IRI's NASA interdisciplinary science project

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NASA Interdisciplinary Science Project

- Engaging remote sensing scientists at NASA, USDA, NOAA, Michigan Tech Univ., with index insurance projects in Africa that IRI supports

- Aim: How can linking satellite data providers and RS scientists to real index insurance projects improve the design process?

Satellite data in index insurance

We work with projects that use these products:

MODIS NDVI
Dominican Republic
Chile
Uruguay

CHIRPS Rainfall:
Honduras
Colombia
Uruguay

ARC2 Rainfall:
Ethiopia
Malawi
Zambia
Senegal

NASA Interdisciplinary Science Project

-Smallholder crop area mapped with wall-to-wall WorldView sub-meter panchromatic image texture: a test case for Tigray, Ethiopia

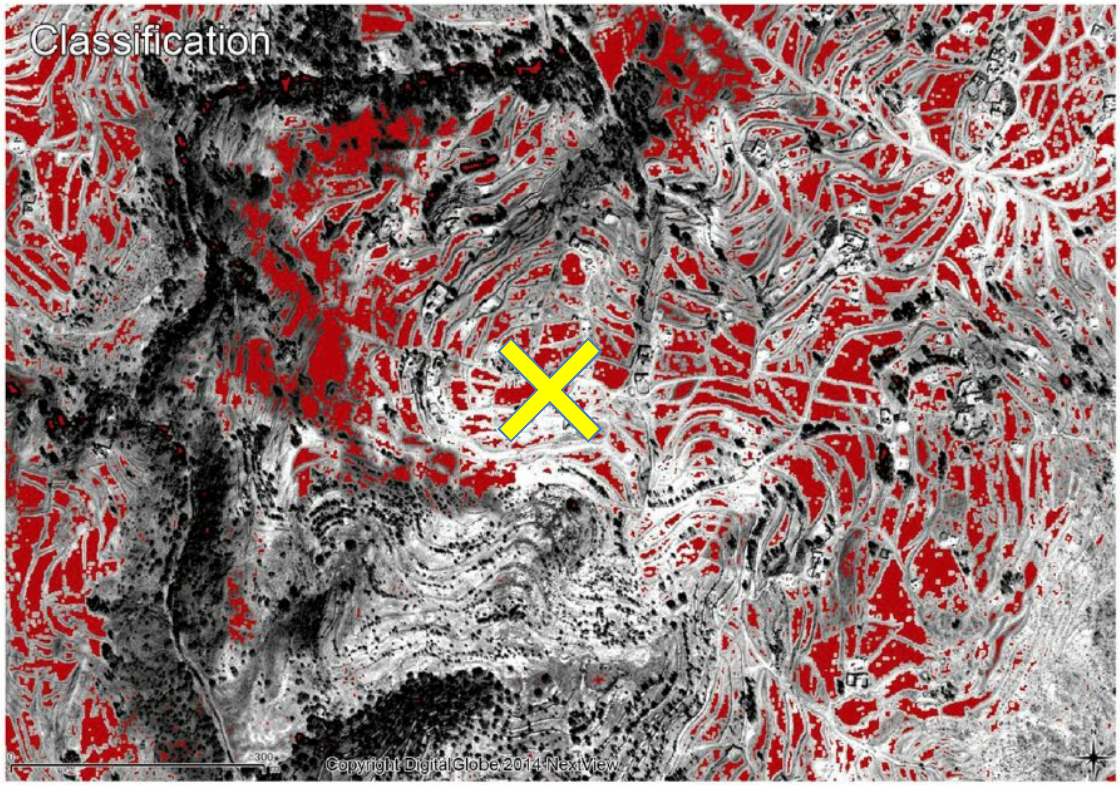
In Review, Remote Sensing of Environment

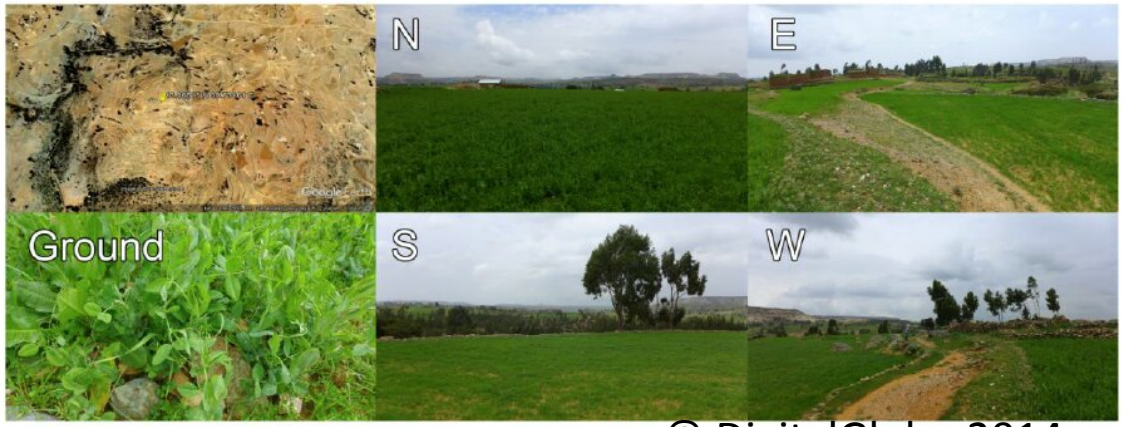
-Exploiting the convergence of evidence in satellite data for advanced weather index insurance design

In Review, Weather Climate & Society

-Farmer Perception and Index Design in Weather Insurance for Agriculture in the Developing World: an Ethiopia Case Study

Working Paper





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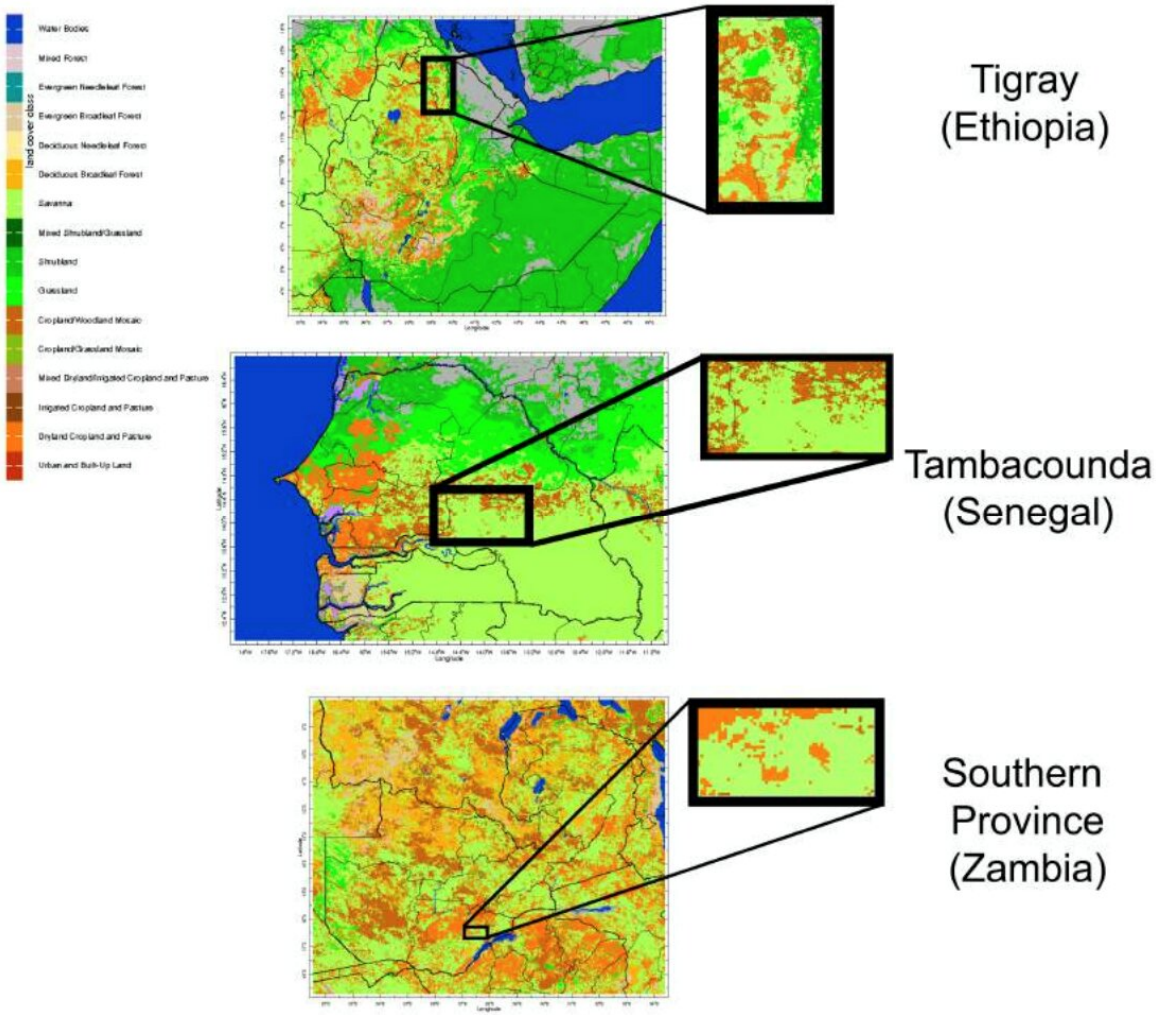
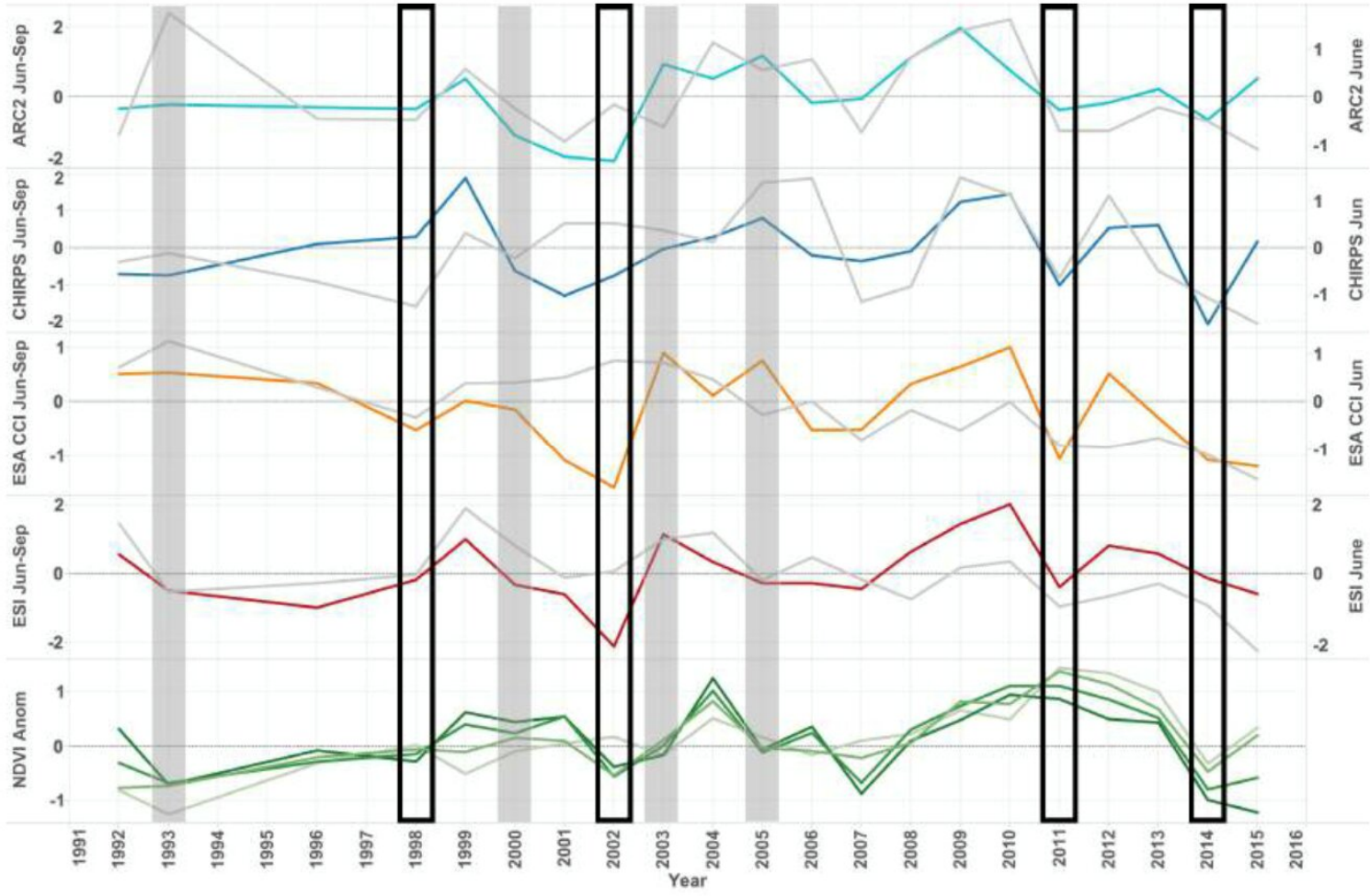
Very High Resolution ~1m data Cropped Area Estimation Mapping

Multi-resolution, multi-sensor satellite dataset comparisons for use in index design



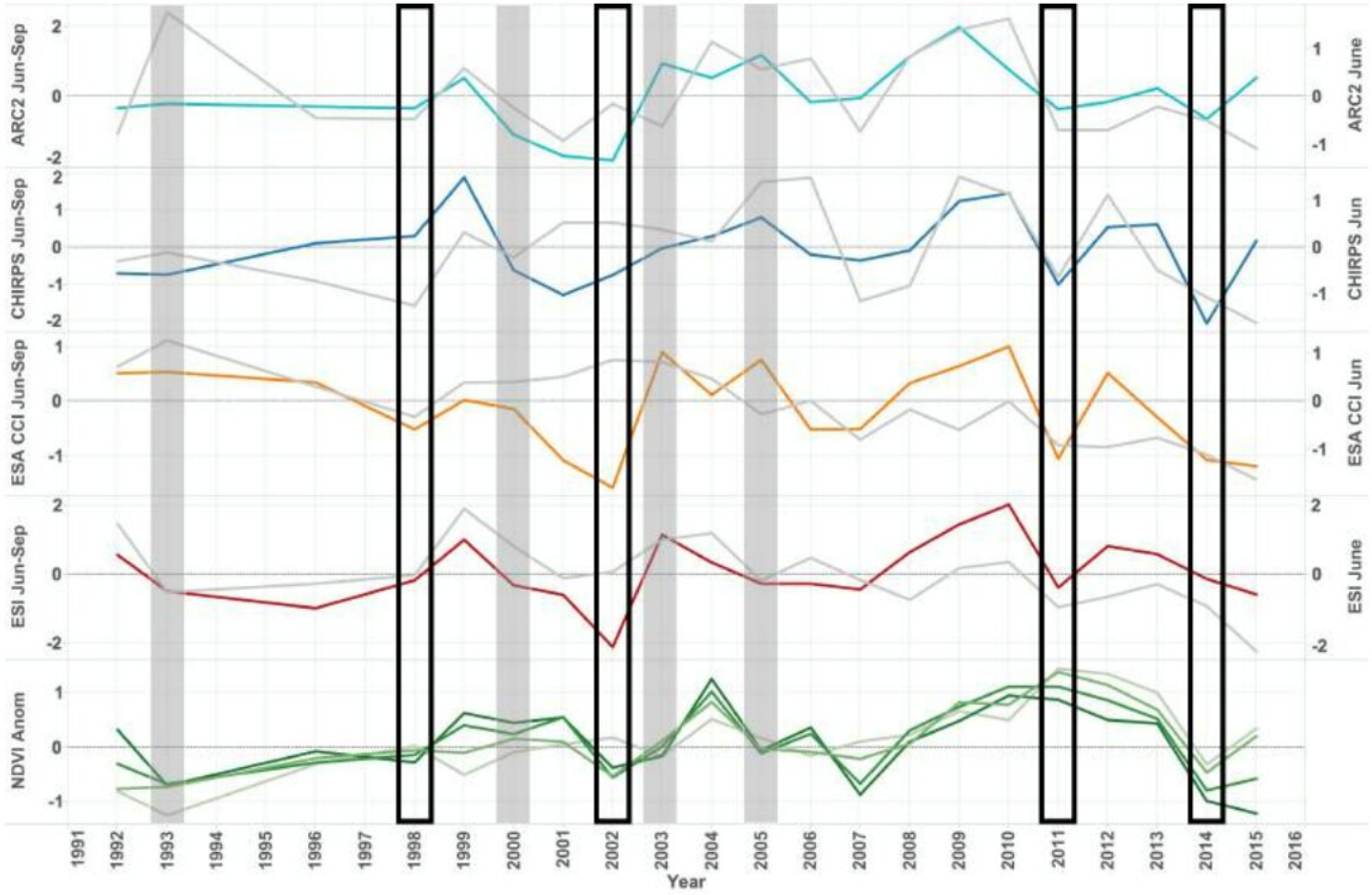
Multi-resolution, multi-sensor satellite dataset comparisons for use in index design

Ethiopia



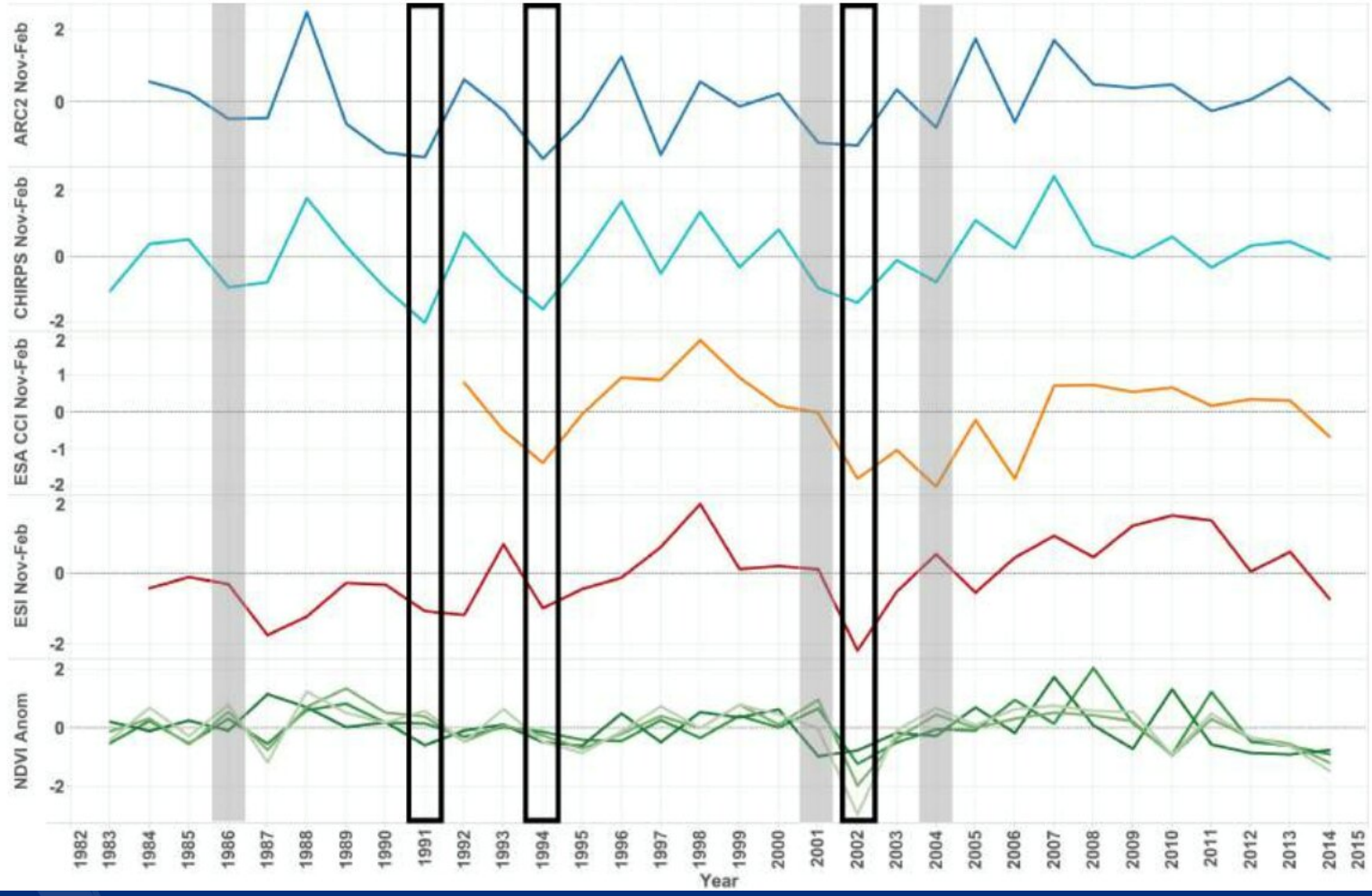
Multi-resolution, multi-sensor satellite dataset comparisons for use in index design

Senegal



Multi-resolution, multi-sensor satellite dataset comparisons for use in index design

Zambia



Farmer perceptions in Ethiopia

- Participatory design process produces essential information, but noisy data

- Can we aggregate information about historic drought events by space and time to get clearer results?

Farmer perceptions in Ethiopia

Table 6. Spatially-aggregated results for First + Second (21 Villages)

DEP VARIABLE	Bad Year Fisrt + Second			
Time	Village	Woreda	Zone	Tigray
Early Rainfall	-0.00492***	-0.00524***	-0.00720***	-0.00886***
	(0.00175)	(0.00184)	(0.00212)	(0.00270)
Late Rainfall	-0.00653***	-0.00708***	-0.00825***	-0.00969***
	(0.00170)	(0.00183)	(0.00205)	(0.00237)
Constant	-0.0979	-0.0276	0.188	0.423
	(0.191)	(0.203)	(0.228)	(0.266)
Observations	693	693	693	693

Standard errors in parentheses; **** p<0.01, ** p<0.05, * p<0.1. Rainfall data is aggregated at the 4 different levels.*

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Where can this take us?

-The power of understanding the story of a season

-Streamlining RS data processing, increasing accessibility

-Bringing data providers closer to real world projects