MEAT & LIVESTOCK AUSTRALIA

meatup FORUM

For the latest in red meat R&D

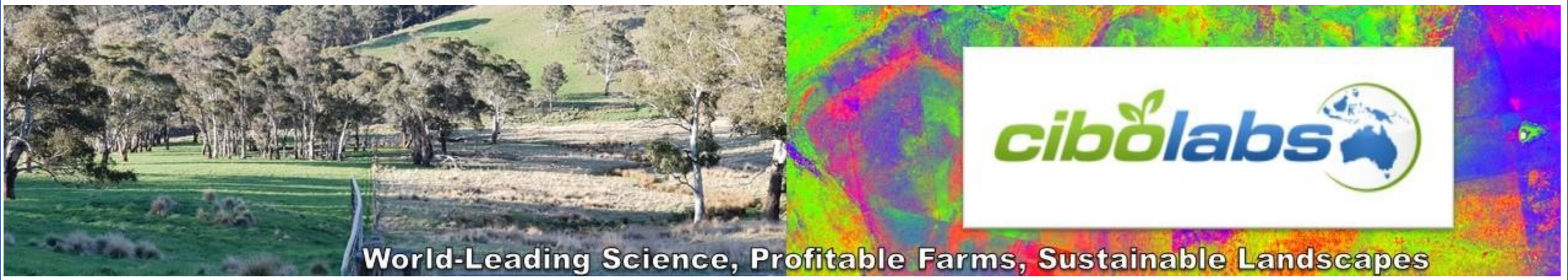
Near-Real-Time Pasture Monitoring For Every Producer

Nation to paddock in a couple of "clicks"

Phil Tickle

Cibo Labs

Email: ptickle@cibolabs.com.au



Cibo Labs is bringing new and more effective approaches to the monitoring and management of Australia's grazing lands.

Our goal is to underpin more profitable farms and more sustainable landscapes.

- *How many kg of available pasture do I have per paddock?*
- *How many grazing days do I have ahead of me with no rain?*
- *What are my ground cover levels, and how do they compare to last month?*
- *How is my land condition tracking relative to regional benchmarks?*

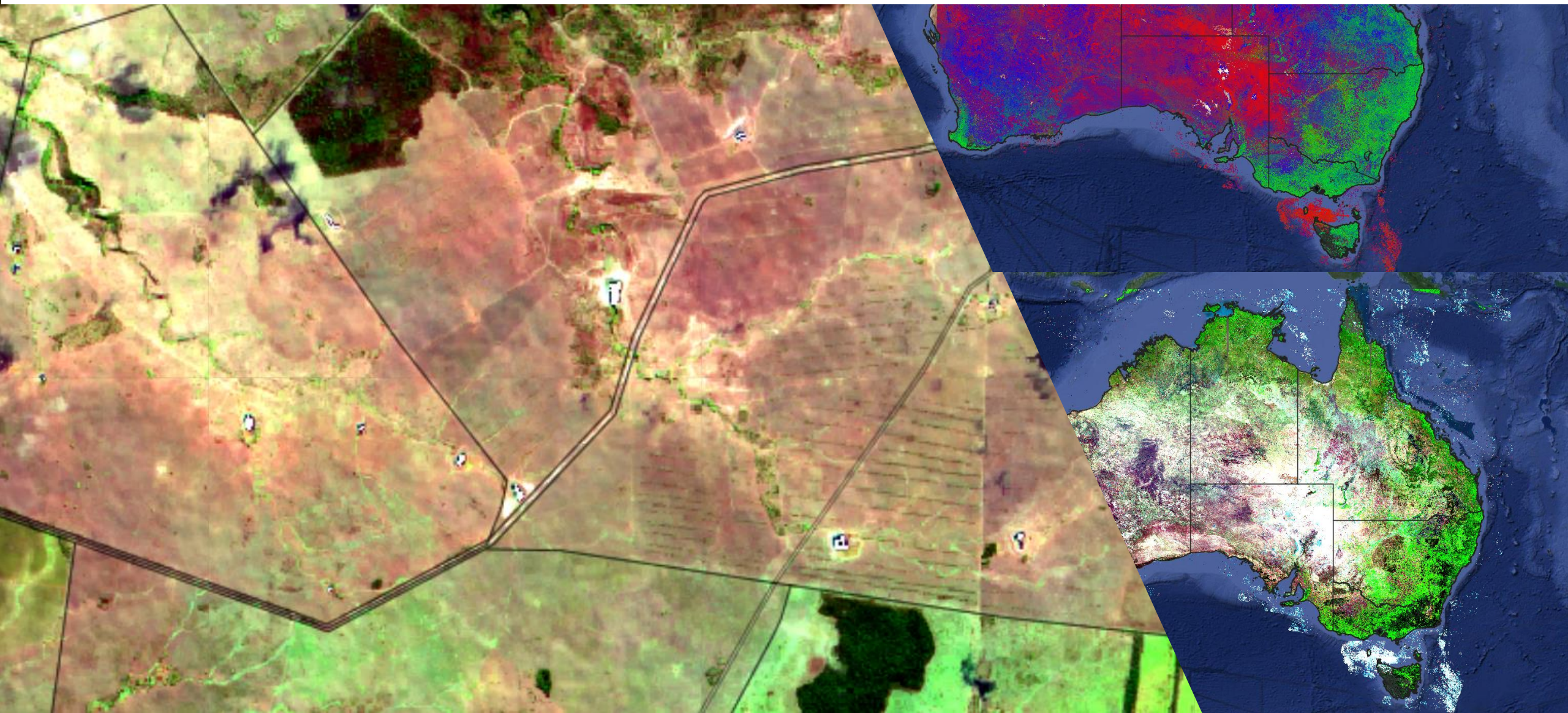
Creating the environment for a producer to bring together information on productivity, profitability and natural capital at paddock or property scales every week or month for a fraction of current costs.

Collaborating with other specialist service providers to deliver seamless information to producers

40 million hectares and counting per week.

Helping make decisions less complicated, more profitable, lower risk and more sustainable

Seamless nation to paddock satellite imagery every 5 days (or daily if you need it)



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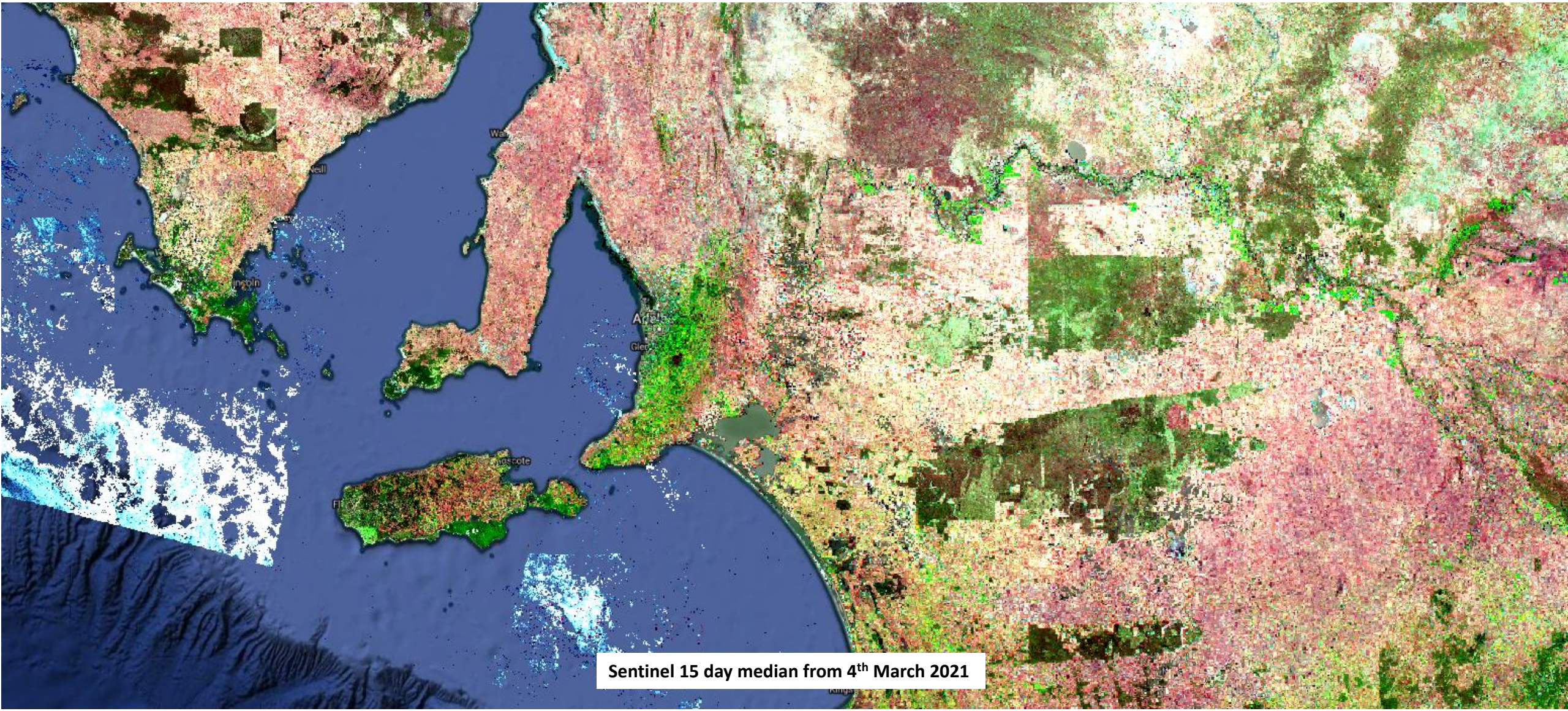

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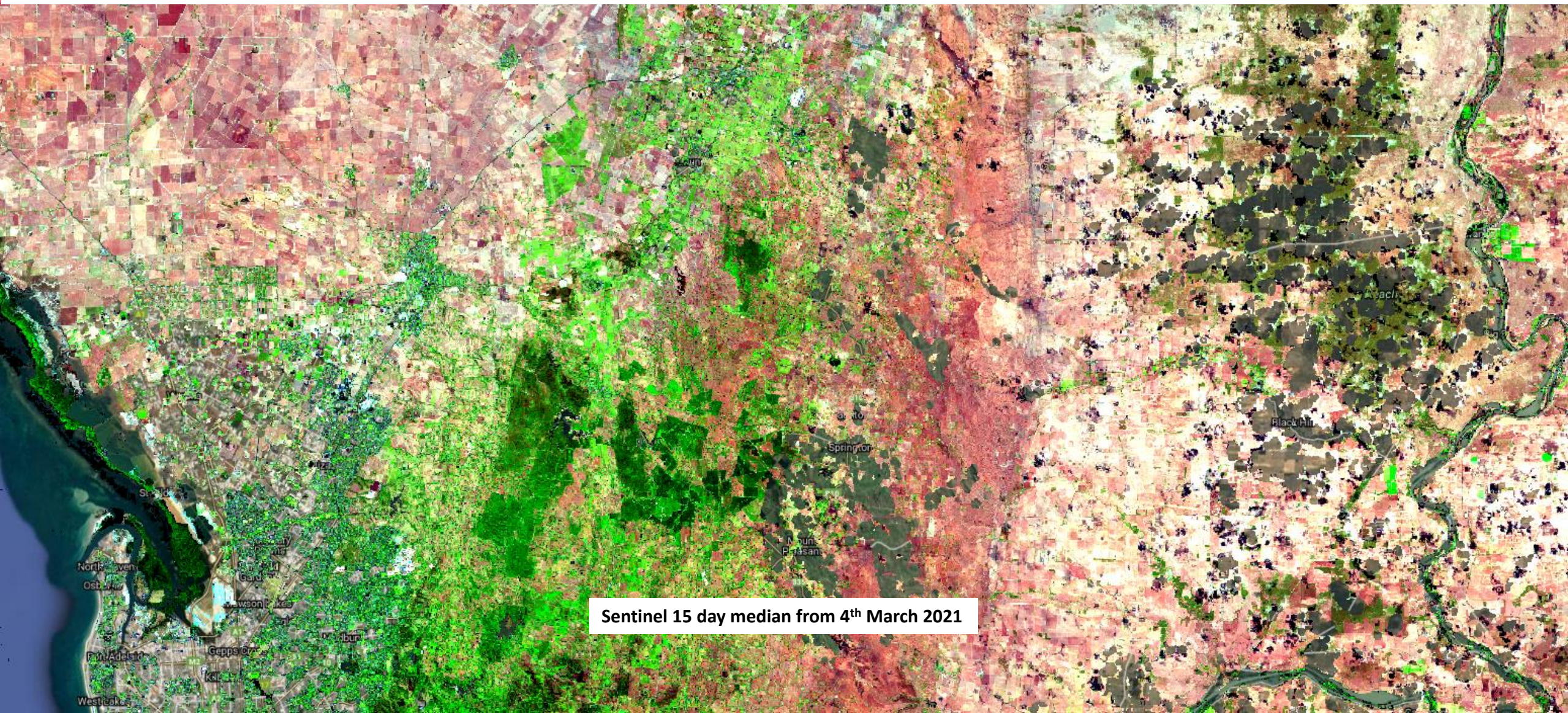

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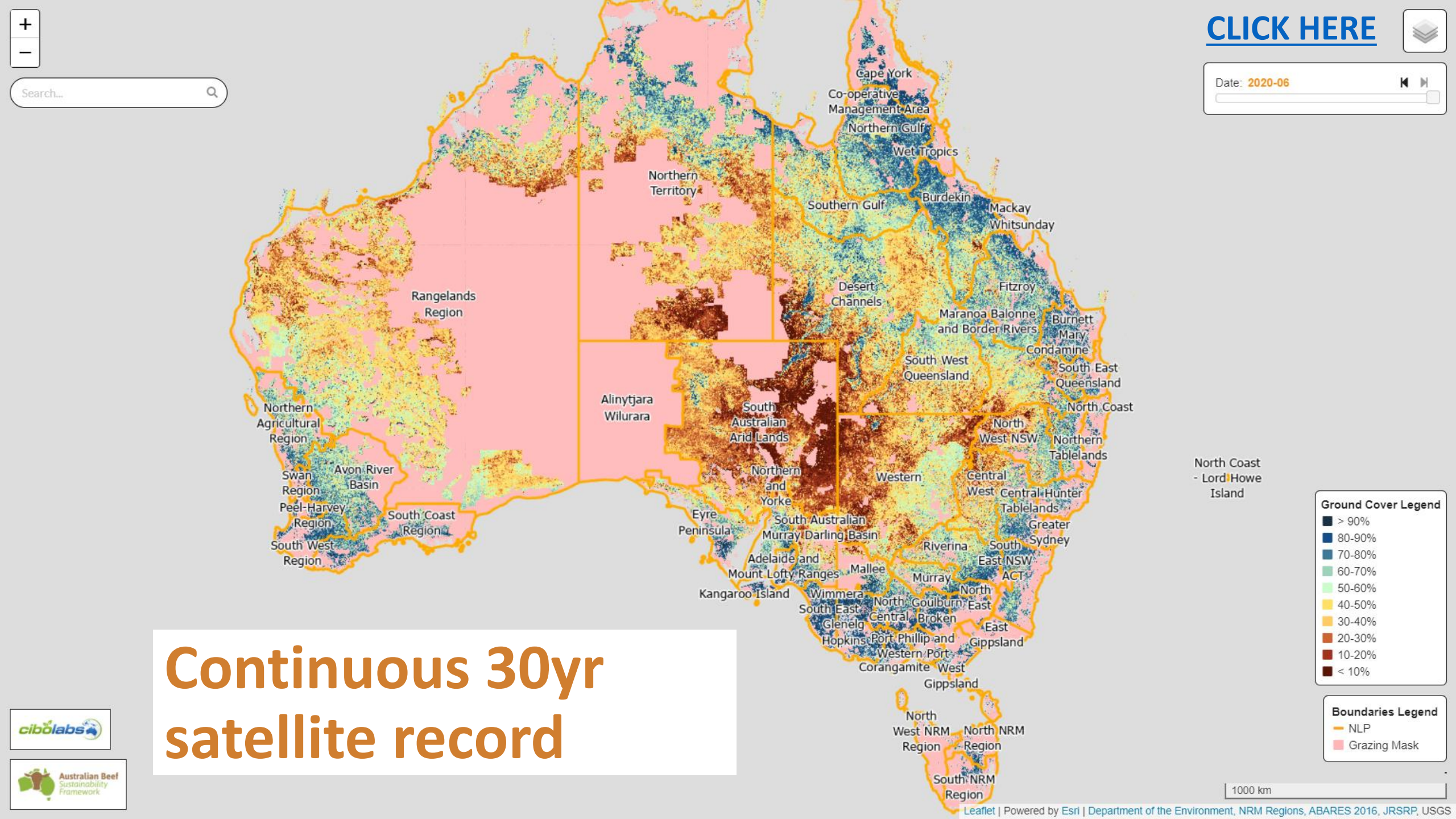
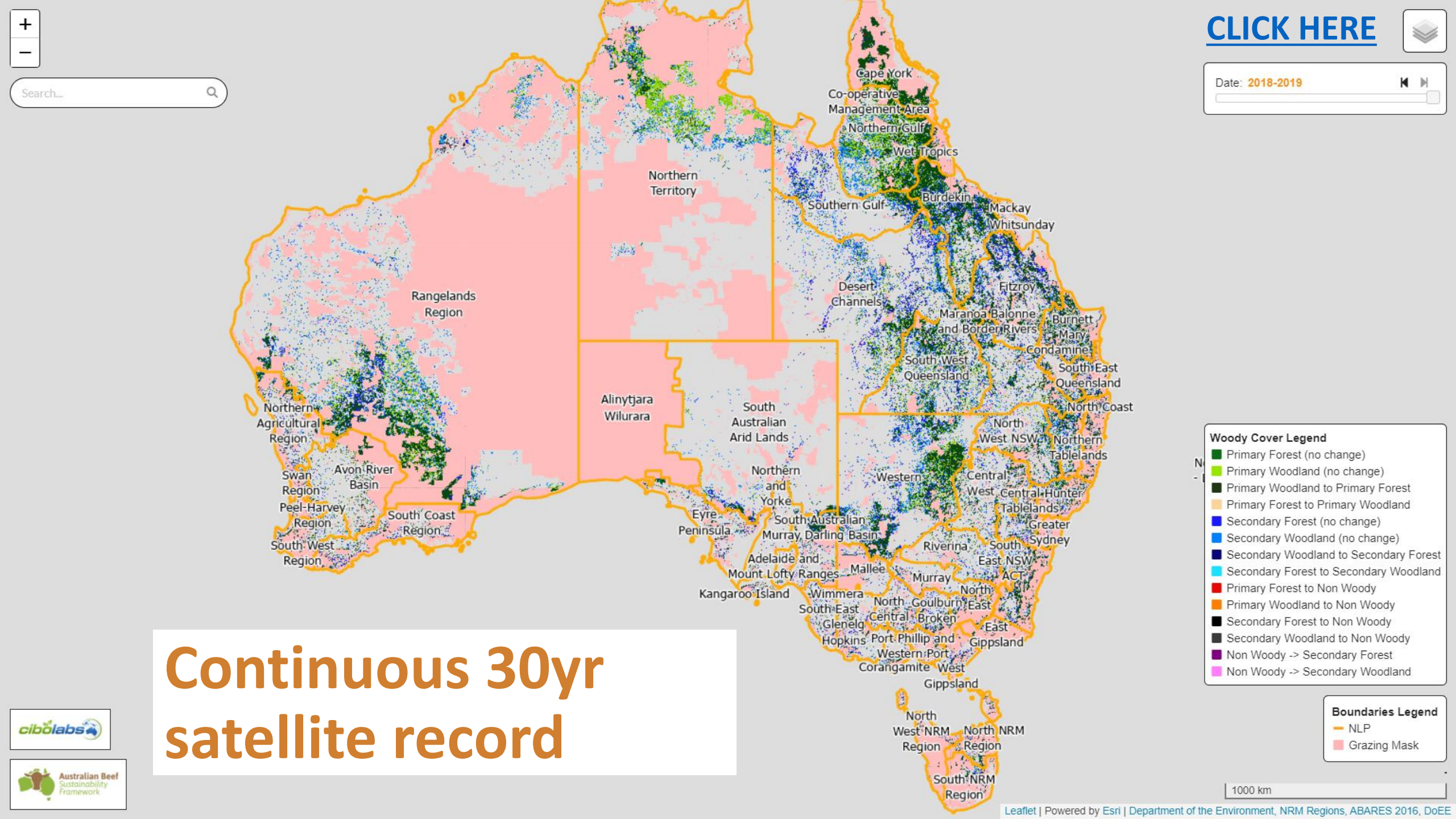


Continuous 30yr satellite record

cibolabs

Australian Beef Sustainability Framework



Continuous 30yr satellite record

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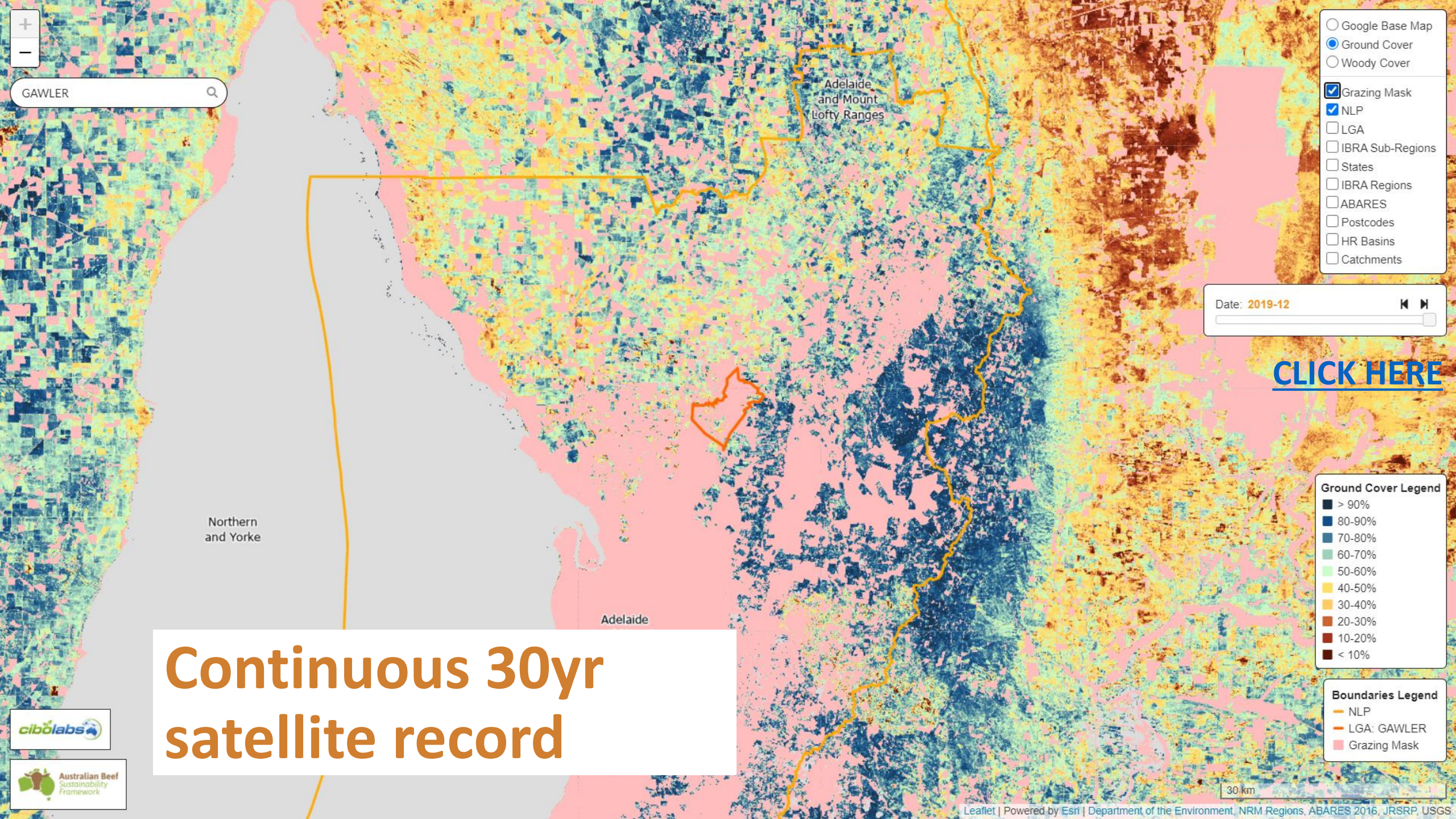
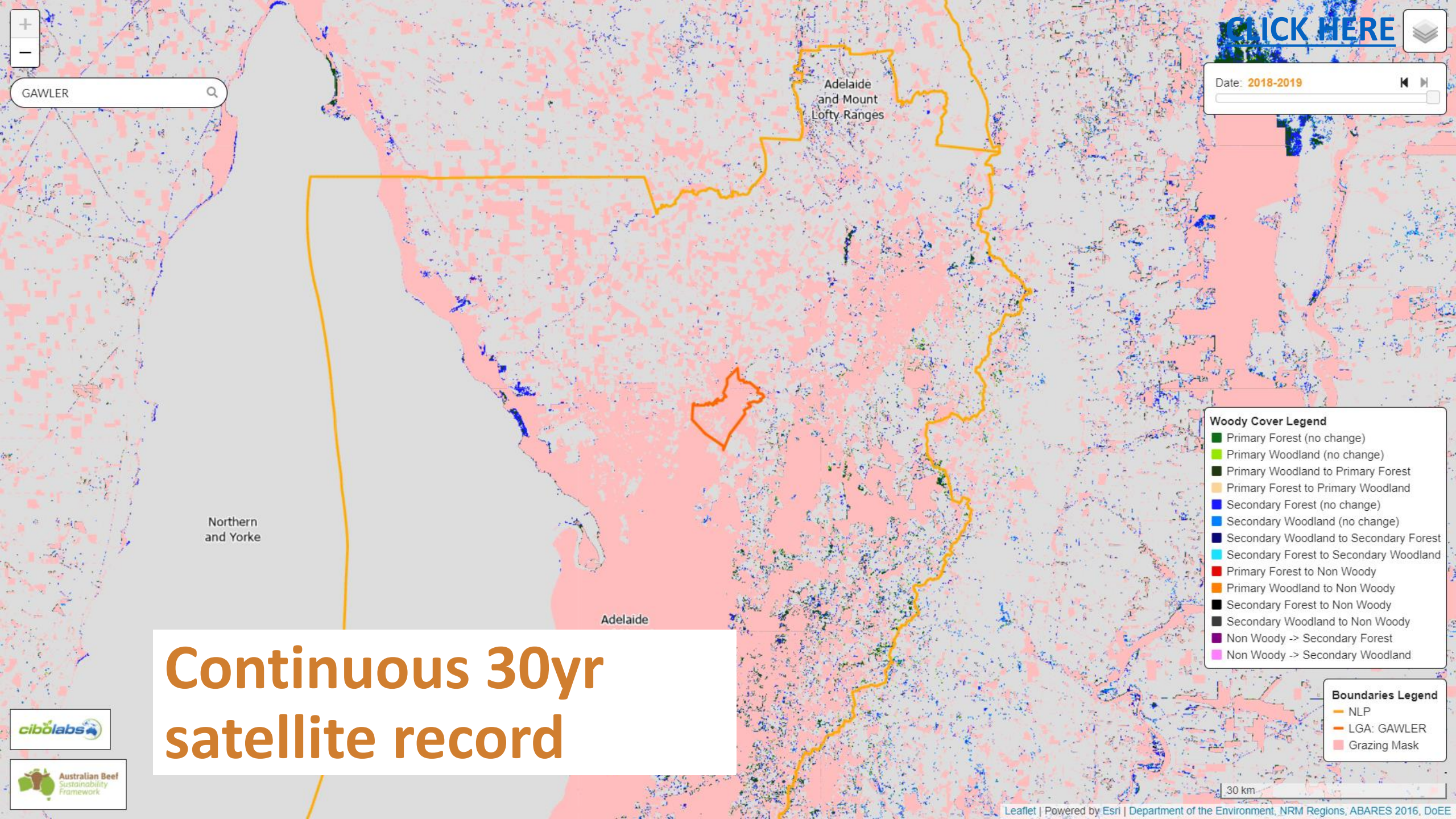
Australian Beef Sustainability Framework



Continuous 30yr satellite record



Continuous 30yr satellite record

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Vegetation Trends Dashboard 2020
Woody Changes Summary - Page 1

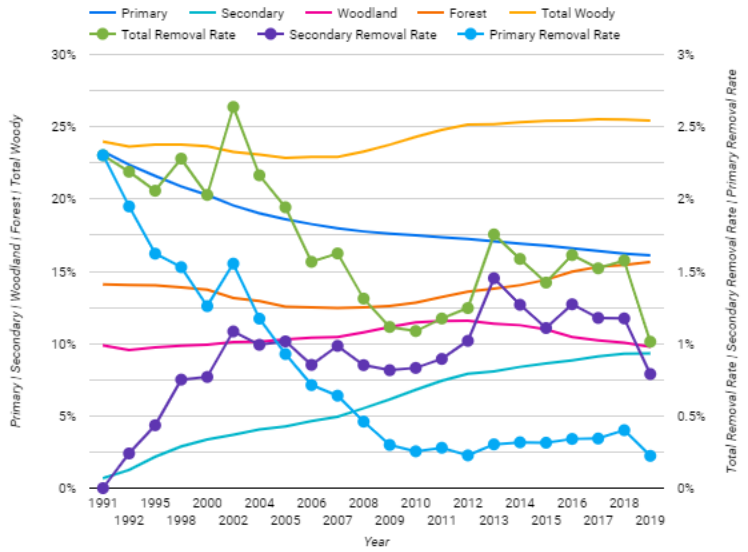
Next Page

The land parcels used to calculate the statistics in this dashboard can be filtered using the nine regional filters on the right. To reset a filter to include all possibilities, click on the filter, then click the minus symbol in its top left corner.

A forest is defined as woody vegetation with a minimum 20% canopy cover (CC), potentially reaching 2 meters high and a minimum area of 0.2 hectares. Sparse woody is defined as woody vegetation with a canopy cover between 5-19%. Primary forest (≥20%CC) or woodland (5-19%CC) is defined as woody vegetation present in 1988. Secondary forest or woodland has been disturbed at anytime post-1988. "Woody" is inclusive of both forest and woodland.

NLP
Local Government Area
IBRA Region
IBRA Sub-Region
Post Code
State / Territory
Basin
River Region
Is in RFA

Total Hectares Selected	Total Land Parcels
485.1M	1.3M



The left y-axis in the above chart represents the percentage of area belonging in the corresponding category. A value of 20% for primary indicates that 20% of the area is classified as primary woody.

Measure	17/18	18/19	10-Year Annual Averages (2009-2018)	10-Year Annual Averages (2010-2019)
National Woody Cover Gain	3.07%	1.73%	3.76%	3.51%
National Forest Cover Gain	1.19%	0.75%	1.59%	1.49%
National Woodland Cover Gain	5.88%	3.23%	6.44%	6.03%
National Woody Cover Loss	-3.15%	-2.02%	-2.84%	-2.82%
National Forest Cover Loss	-1.60%	-1.15%	-1.46%	-1.43%
National Woodland Cover Loss	-5.48%	-3.36%	-4.58%	-4.59%
National Woody Cover Extent	-0.08%	-0.29%	0.92%	0.69%
National Forest Cover Extent	0.90%	1.31%	2.13%	2.19%
National Woodland Cover Extent	-1.56%	-2.75%	-0.65%	-1.27%

The below table is comparing the date period: (Month and Day choice do not matter)

Jan 1, 2017 - Jan 1, 2018

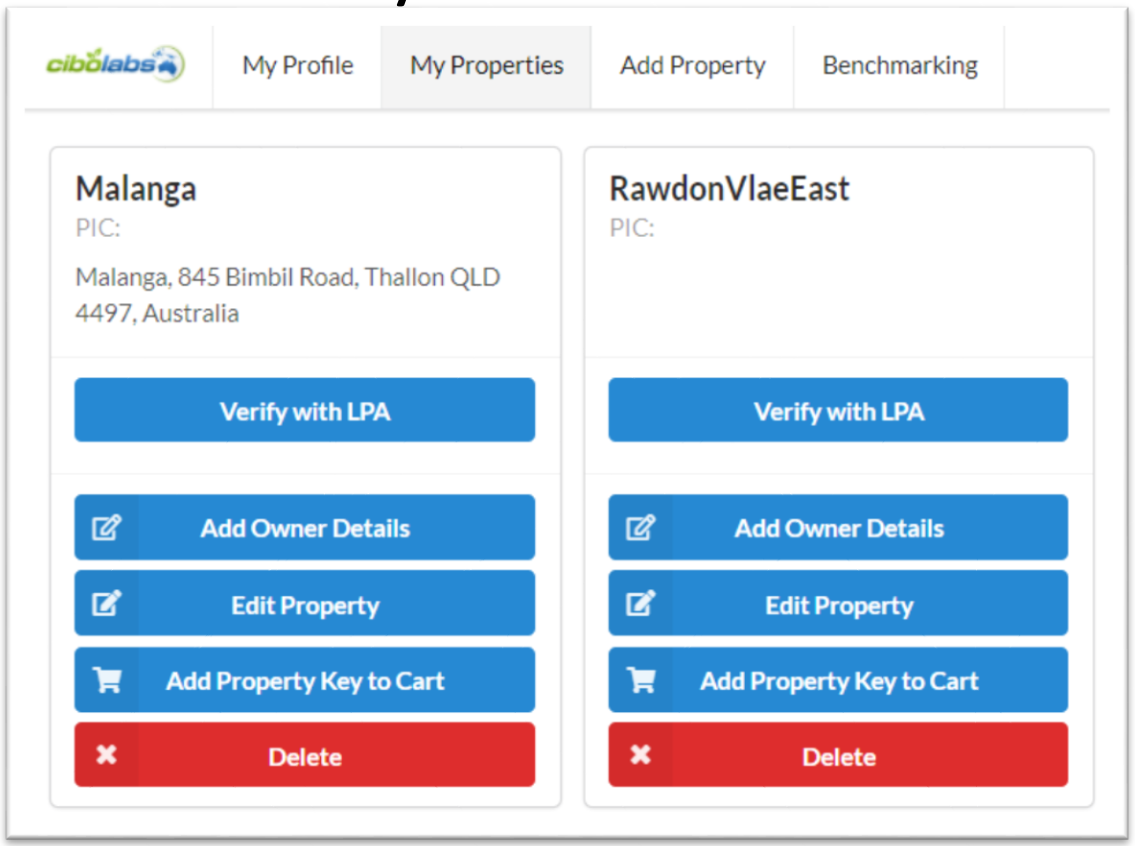
State / Territory	NLP	Total Woody Area Change	Total Woody Area Change (Ha)	Primary Woody Area Change	Primary Woody Area Change (Ha)
ACT	ACT	5.64%	1,000	-0.03%	-3
NSW	Central Tablelands	2.61%	20,022	-0.3%	-1,508
NSW	Central West	0.57%	9,683	-1.88%	-20,085
NSW	Greater Sydney	0.09%	75	-0.37%	-206
NSW	Hunter	-0.13%	-957	-0.91%	-4,170
NSW	Murray	4.68%	20,895	-0.84%	-1,847
NSW	North Coast	2.04%	11,418	-0.52%	-1,953
NSW	North West NSW	0.92%	17,907	-1.13%	-12,366
NSW	Northern Tablelands	4.98%	72,927	-0.28%	-2,603
NSW	Riverina	4.08%	30,657	-1.09%	-4,307
NSW	South East NSW	1.57%	23,871	-0.26%	-2,872
NSW	Western	-0.24%	-25,499	-0.86%	-58,523
NT	Northern Territory	-1.89%	-197,123	-1.78%	-124,962
QLD	Burdekin	0.38%	33,342	-0.42%	-27,810
QLD	Burnett Mary	-0.33%	-7,379	-0.75%	-12,678

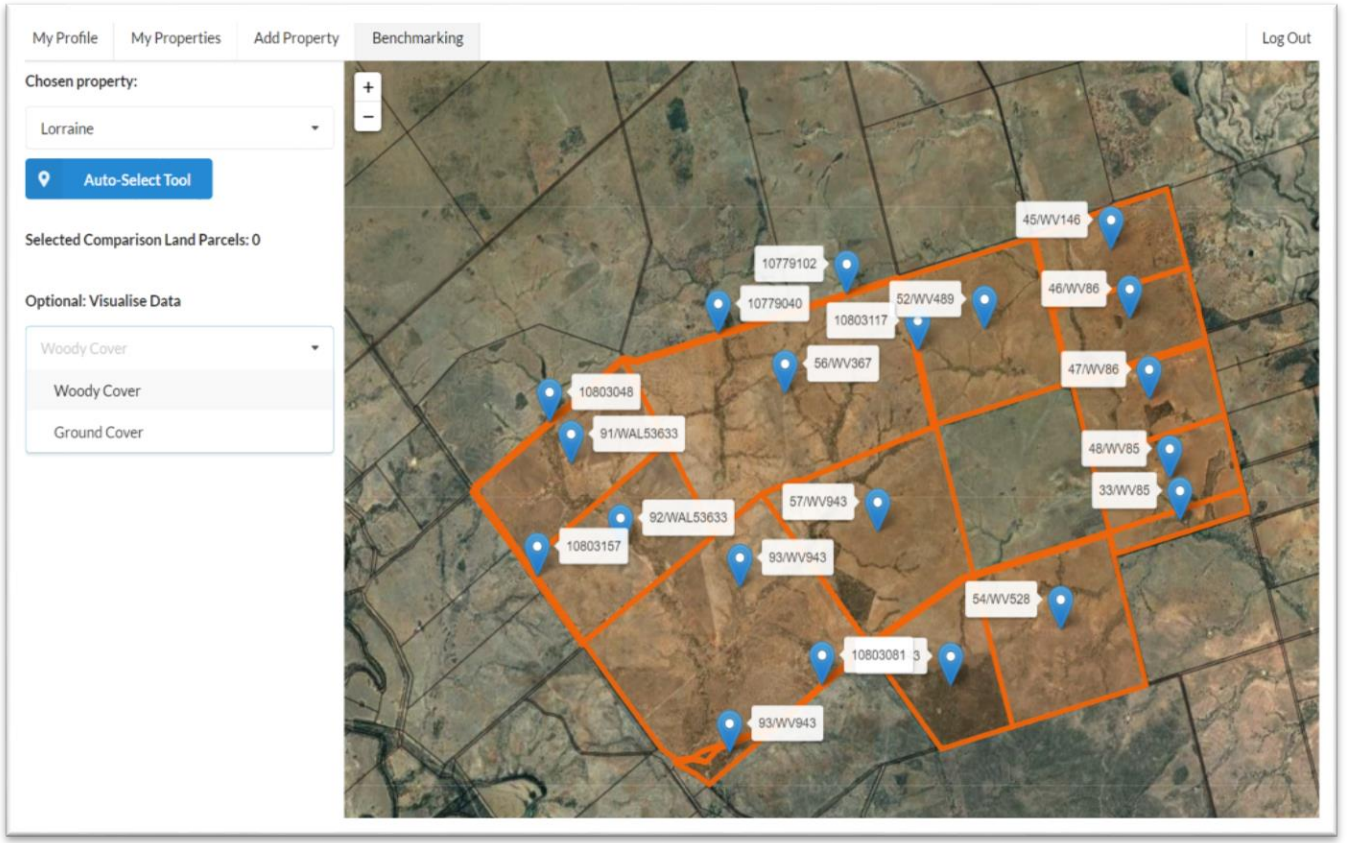
Data Last Updated: 3/4/2021 3:19:58 PM | Privacy Policy

CLICK HERE

- Data summarised or stored for every land parcel >1ha
- Dominant land use to identify parcels with potential to be grazed

MyFarmKey – A Verifiable Digital Record for every Farm

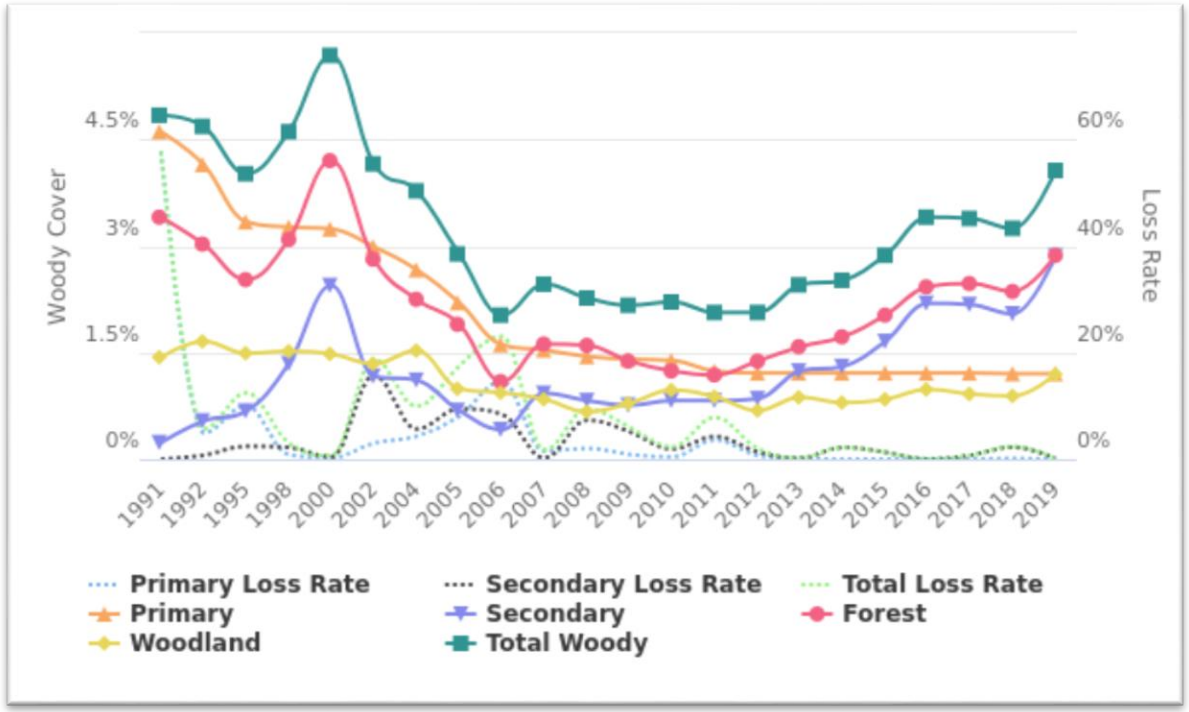


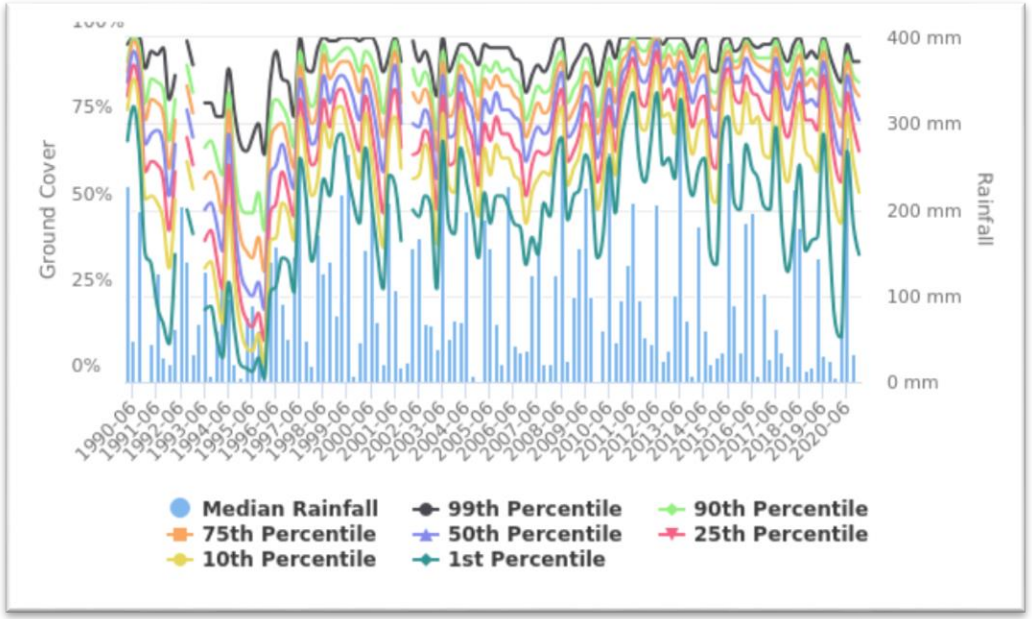


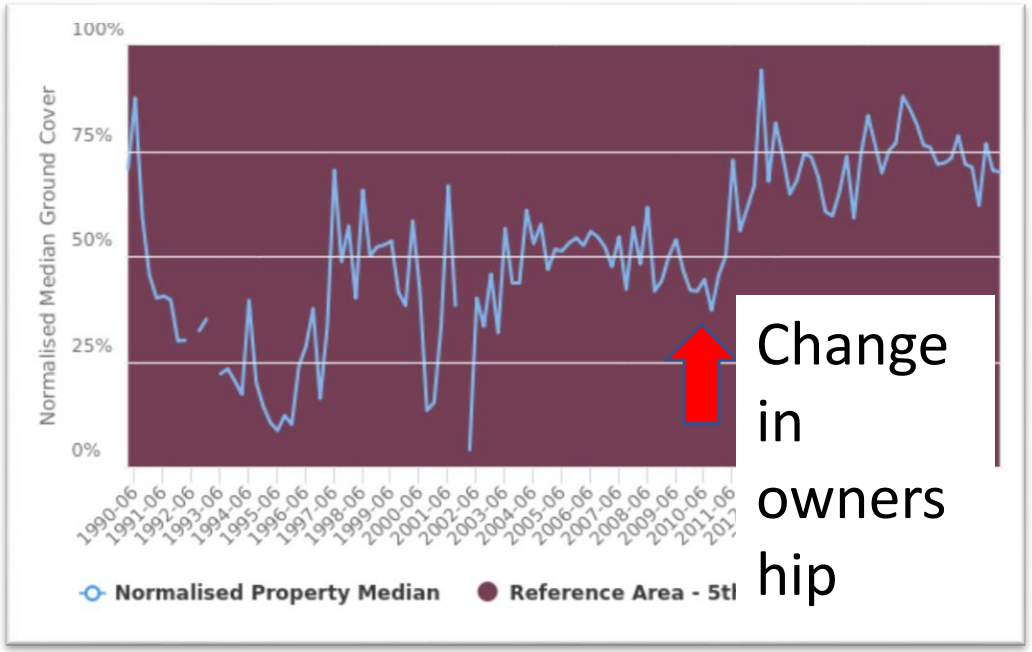
Personal, business, front-gate address, land parcels boundaries , land title and LPA credentials integrated into single, verified digital record
Solves the PIC Register problem and deliveres immediate value to the producer.

www.cibolabs.com.au/myfarmkey

MyFarmKey – 30 years of satellite data products and auditable reports in a few minutes



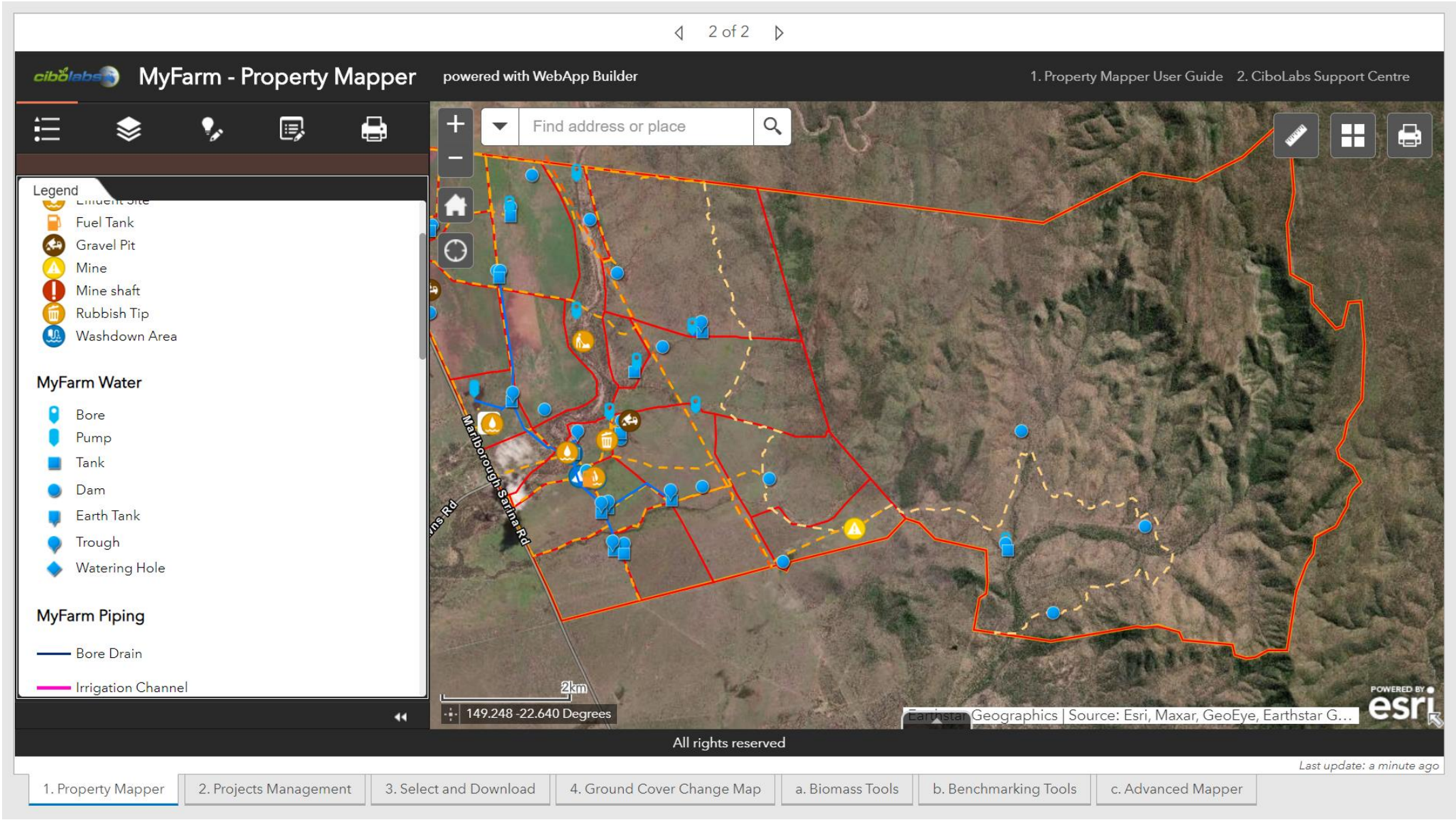




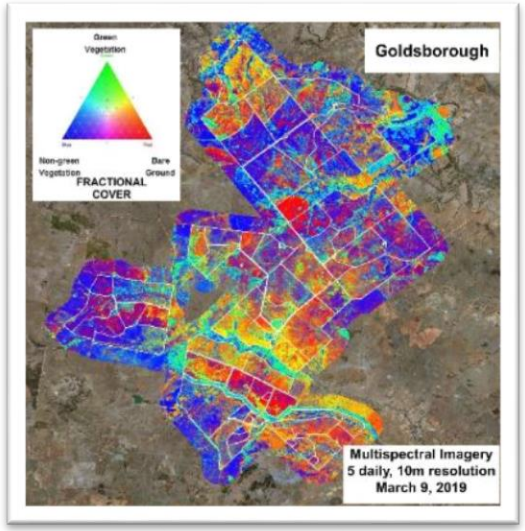
www.cibolabs.com.au/myfarmkey

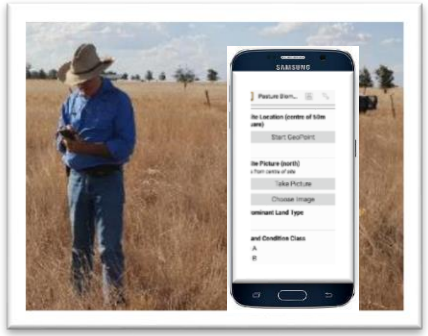
MyFarm Mapper

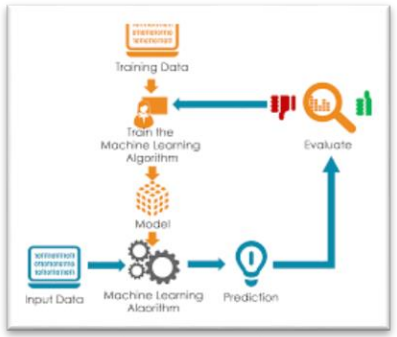
Lack of consistent, high quality farm mapping is a major barrier to technology adoption and system integration

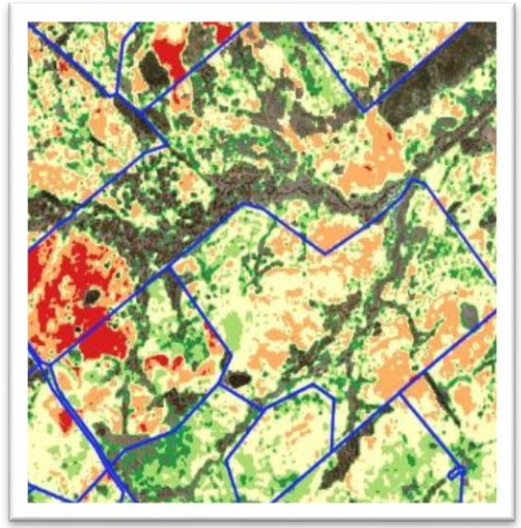


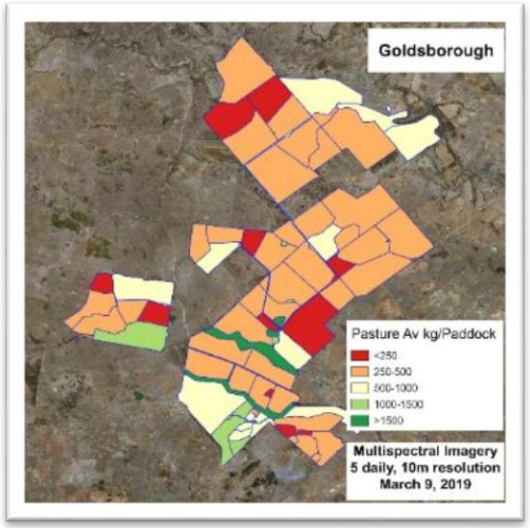
Integrated Pasture Assessment and Prediction











Time-series satellite imagery scout maps to optimise field pasture assessments

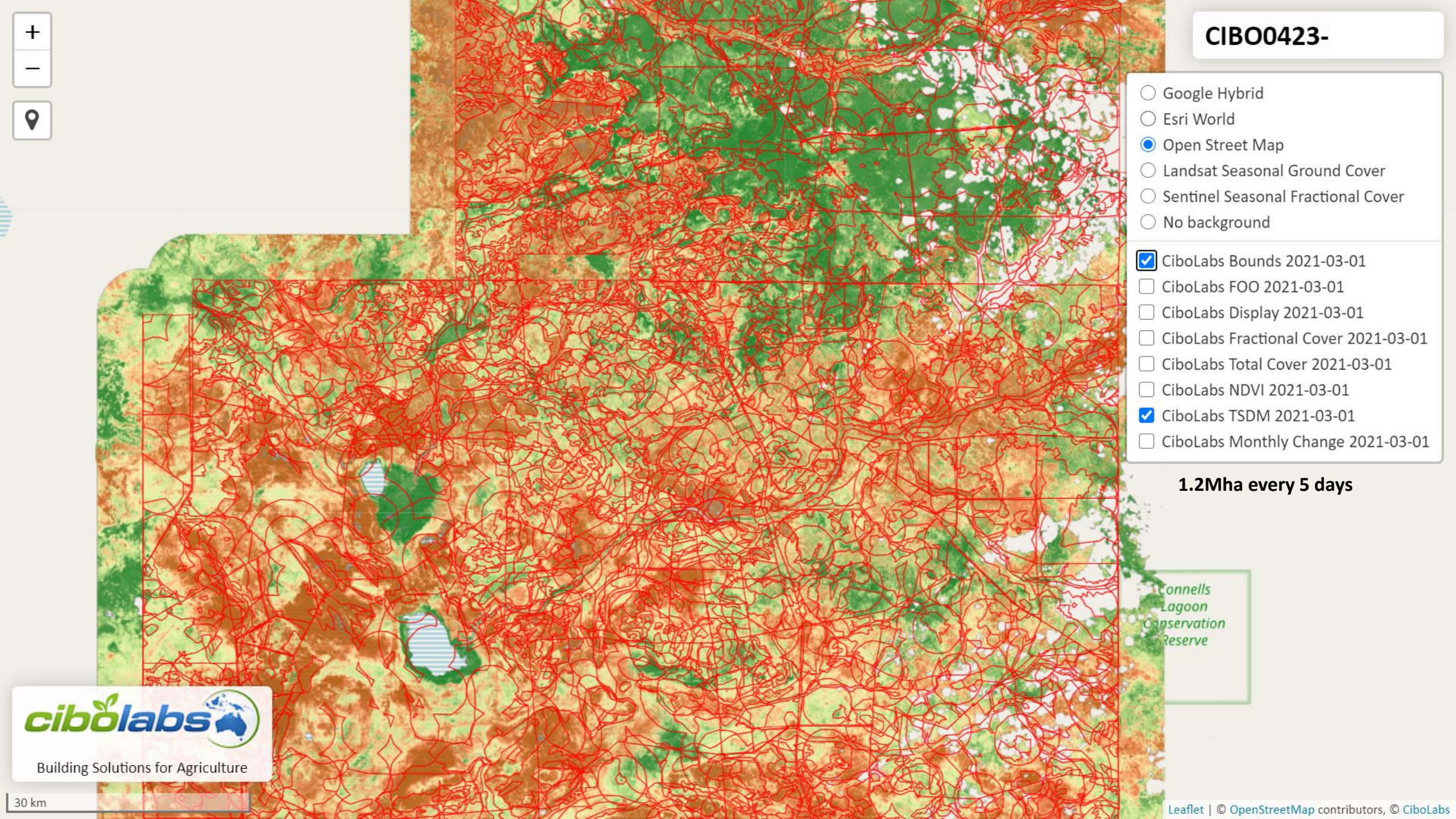
Directed in-paddock sampling. Detailed pasture yield assessments. Dedicated data collection Apps

5 daily time-series satellite data. Machine Learning based on field data. A "living laboratory" based on producer and Cibo data.

Estimates of pasture biomass for every paddock every 5-15 days. No "black boxes"

Estimates of Feed on Offer for every paddock, property and the company every 5,15-30 days

Objective, repeatable, extendable, defendable...doable, time-saving, cost-effective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Esri World
Open Street Map
Landsat Seasonal Ground Cover
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CiboLabs FOO 2021-03-01
CiboLabs Display 2021-03-01
CiboLabs Fractional Cover 2021-03-01
CiboLabs Total Cover 2021-03-01
CiboLabs NDVI 2021-03-01
CiboLabs TSDM 2021-03-01
CiboLabs Monthly Change 2021-03-01
1.2Mha every 5 days
Connells Lagoon Conservation Reserve
ciboLabs
Building Solutions for Agriculture
30 km
Leaflet | © OpenStreetMap contributors, © CiboLabs


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Sentinel Seasonal Fractional Cover
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CiboLabs TSDM 2021-02-26
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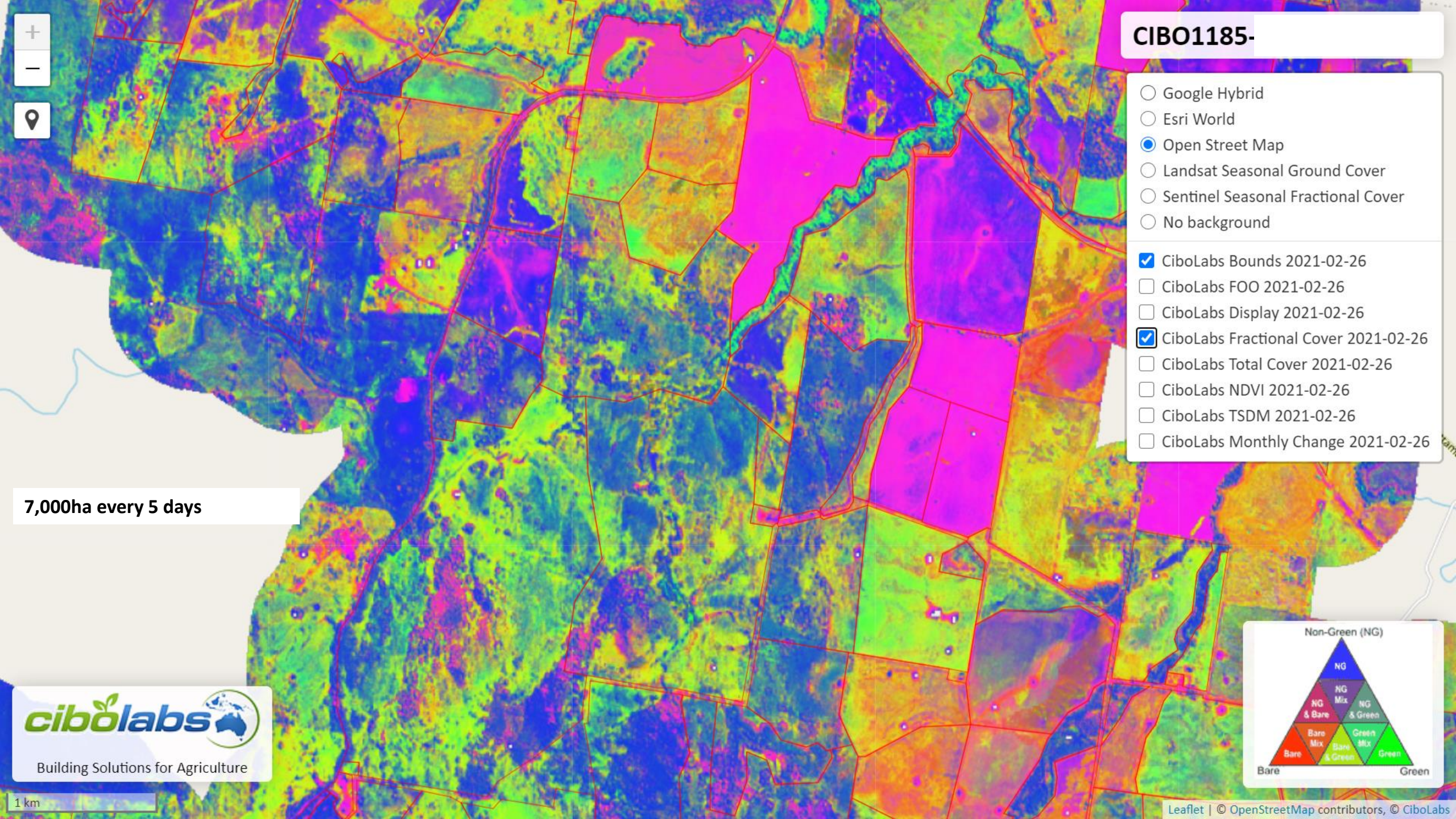
7,000ha every 5 days
cibolabs
Building Solutions for Agriculture
1 km
Leaflet | © OpenStreetMap contributors, © CiboLabs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CiboLabs Total Cover 2021-02-26
CiboLabs NDVI 2021-02-26
CiboLabs TSDM 2021-02-26
CiboLabs Monthly Change 2021-02-26
7,000ha every 5 days
Non-Green (NG)
NG
NG Mix
NG & Bare
NG & Green
Bare Mix
Bare & Green
Green Mix
Bare
Green
Bare
Green
cibolabs
Building Solutions for Agriculture
1 km
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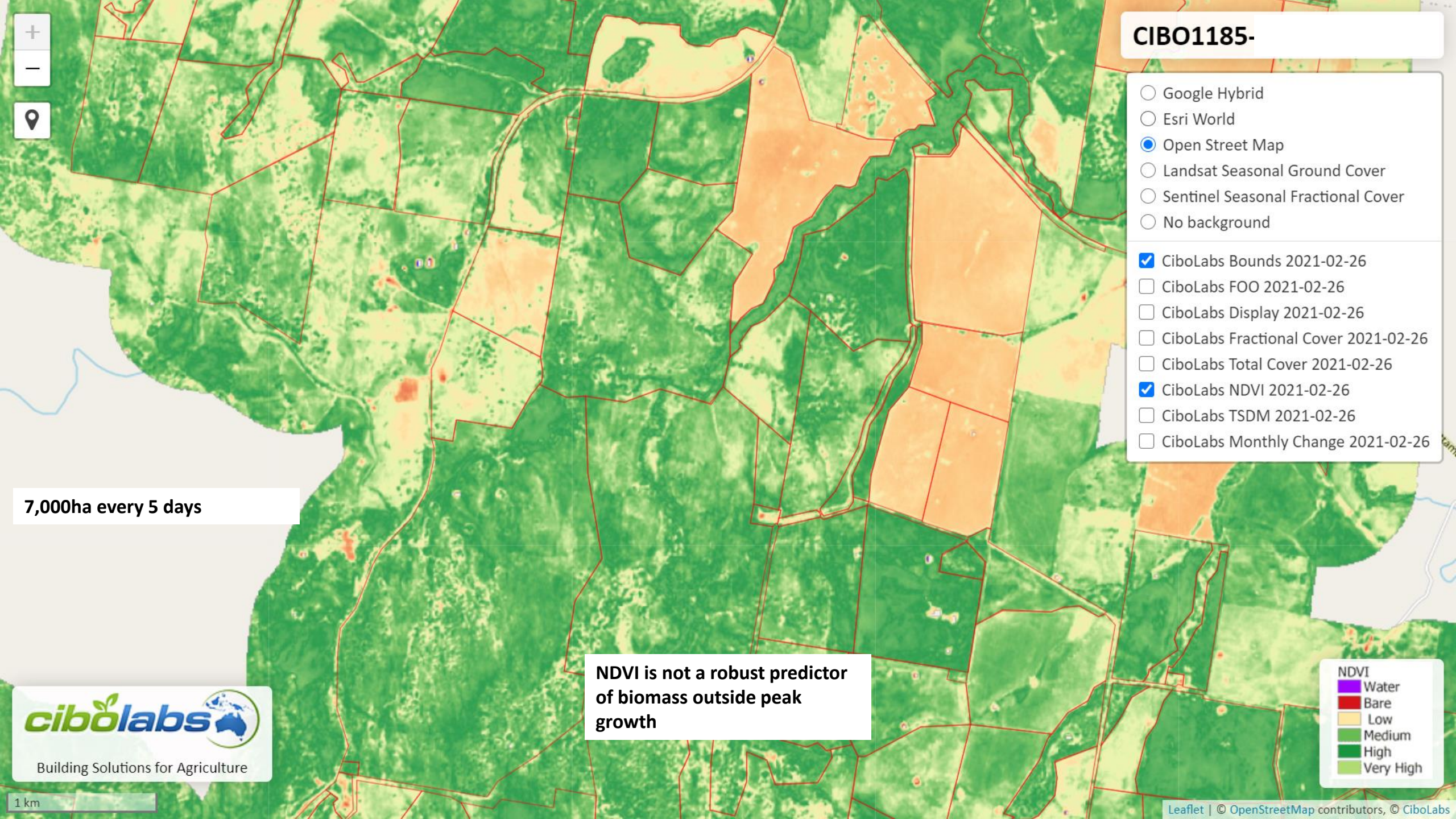
CiboLabs NDVI 2021-02-26
CiboLabs TSDM 2021-02-26
CiboLabs Monthly Change 2021-02-26
7,000ha every 5 days
Total Cover
> 90%
80 - 90
70 - 80
60 - 70
50 - 60
40 - 50
30 - 40
20 - 30
10 - 20
< 10%
cibolabs
Building Solutions for Agriculture
1 km
Leaflet | © OpenStreetMap contributors, © CiboLabs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CiboLabs NDVI 2021-02-26
CiboLabs TSDM 2021-02-26
CiboLabs Monthly Change 2021-02-26
7,000ha every 5 days
NDVI is not a robust predictor of biomass outside peak growth
NDVI
Water
Bare
Low
Medium
High
Very High
ciboLabs
Building Solutions for Agriculture
1 km
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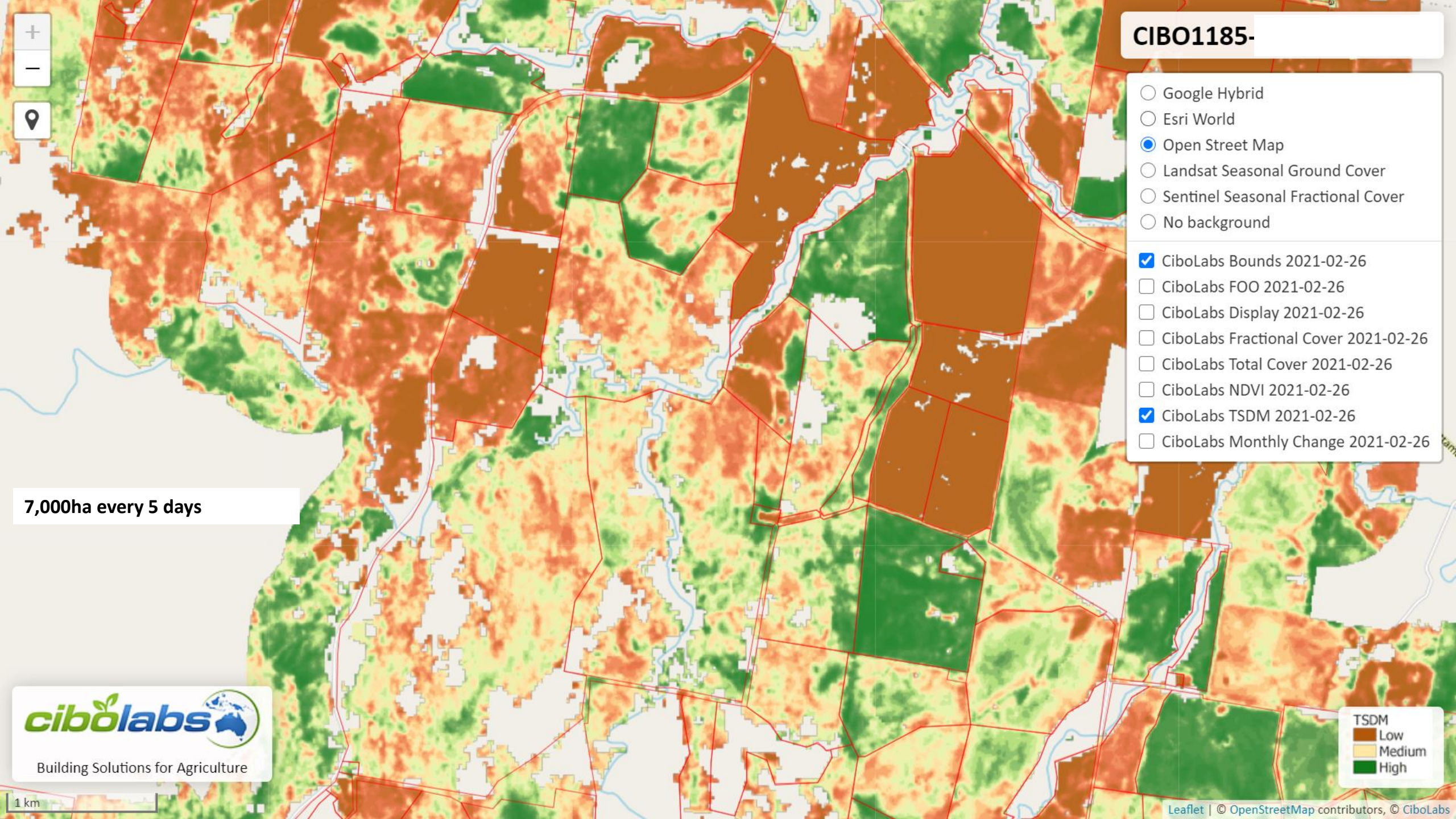
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CiboLabs Monthly Change 2021-02-26
7,000ha every 5 days
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Building Solutions for Agriculture
TSDM
Low
Medium
High
1 km
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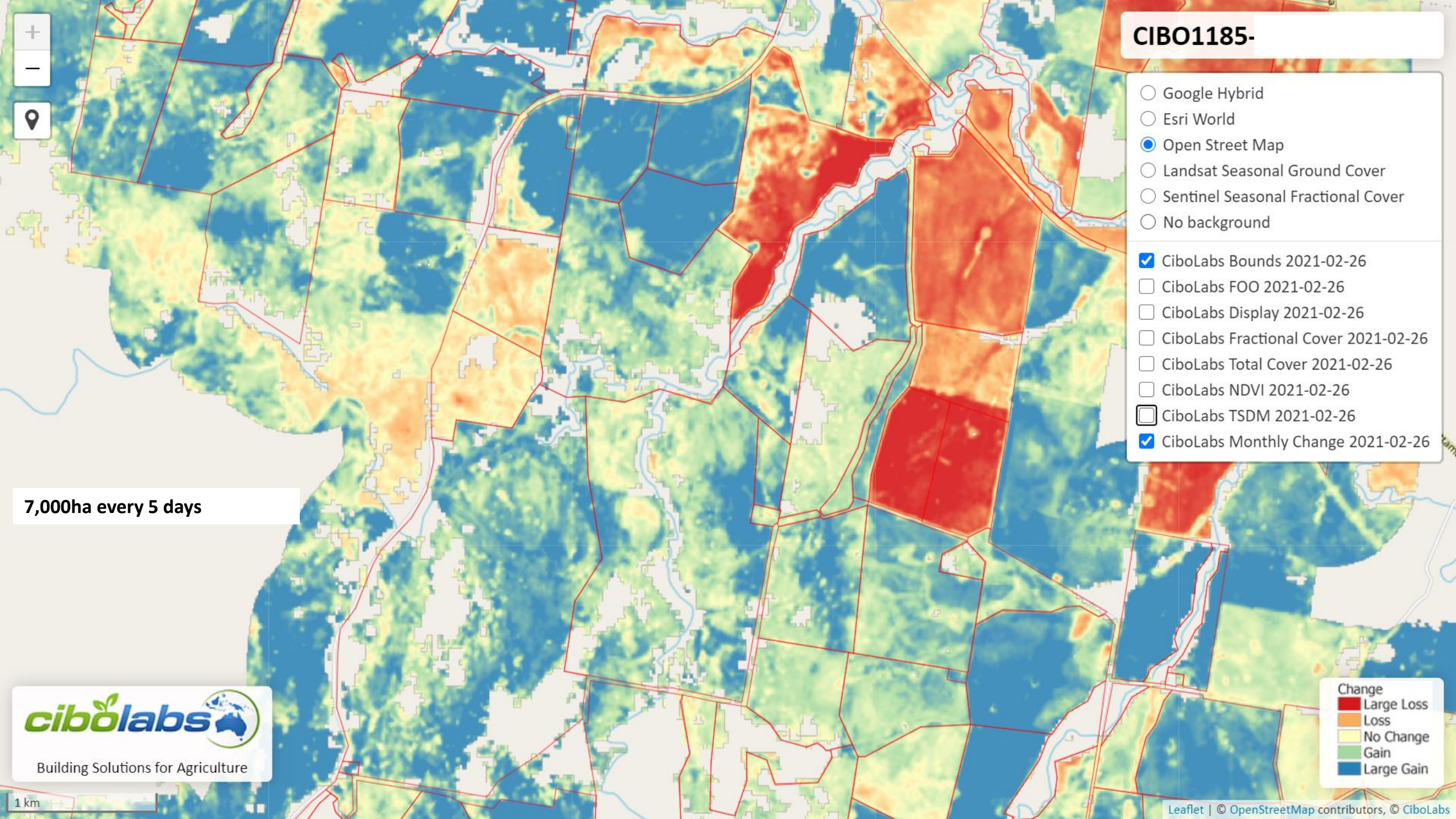
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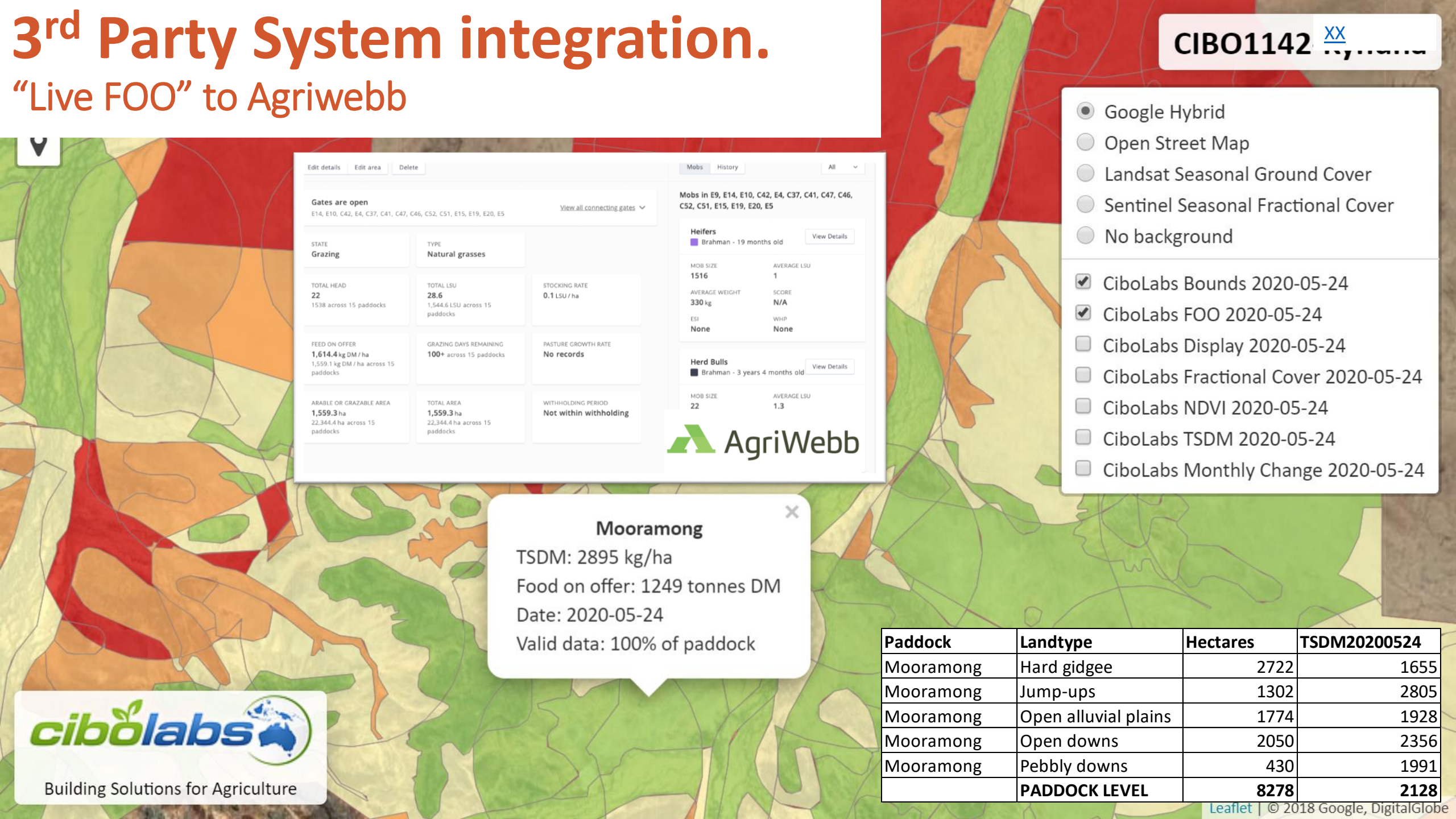
CiboLabs TSDM 2021-02-26
CiboLabs Monthly Change 2021-02-26
7,000ha every 5 days
Change
Large Loss
Loss
No Change
Gain
Large Gain
Building Solutions for Agriculture
1 km
Leaflet | © OpenStreetMap contributors, © CiboLabs

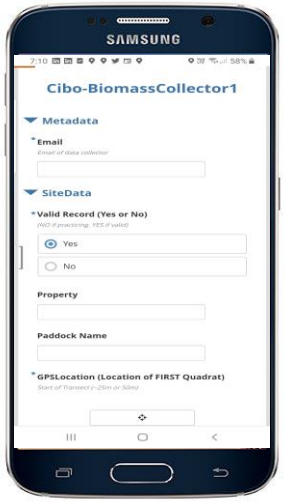
3rd Party System integration.

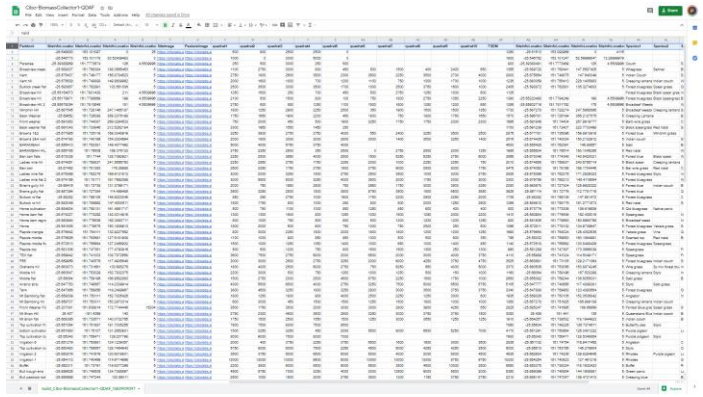
"Live FOO" to Agriwebb

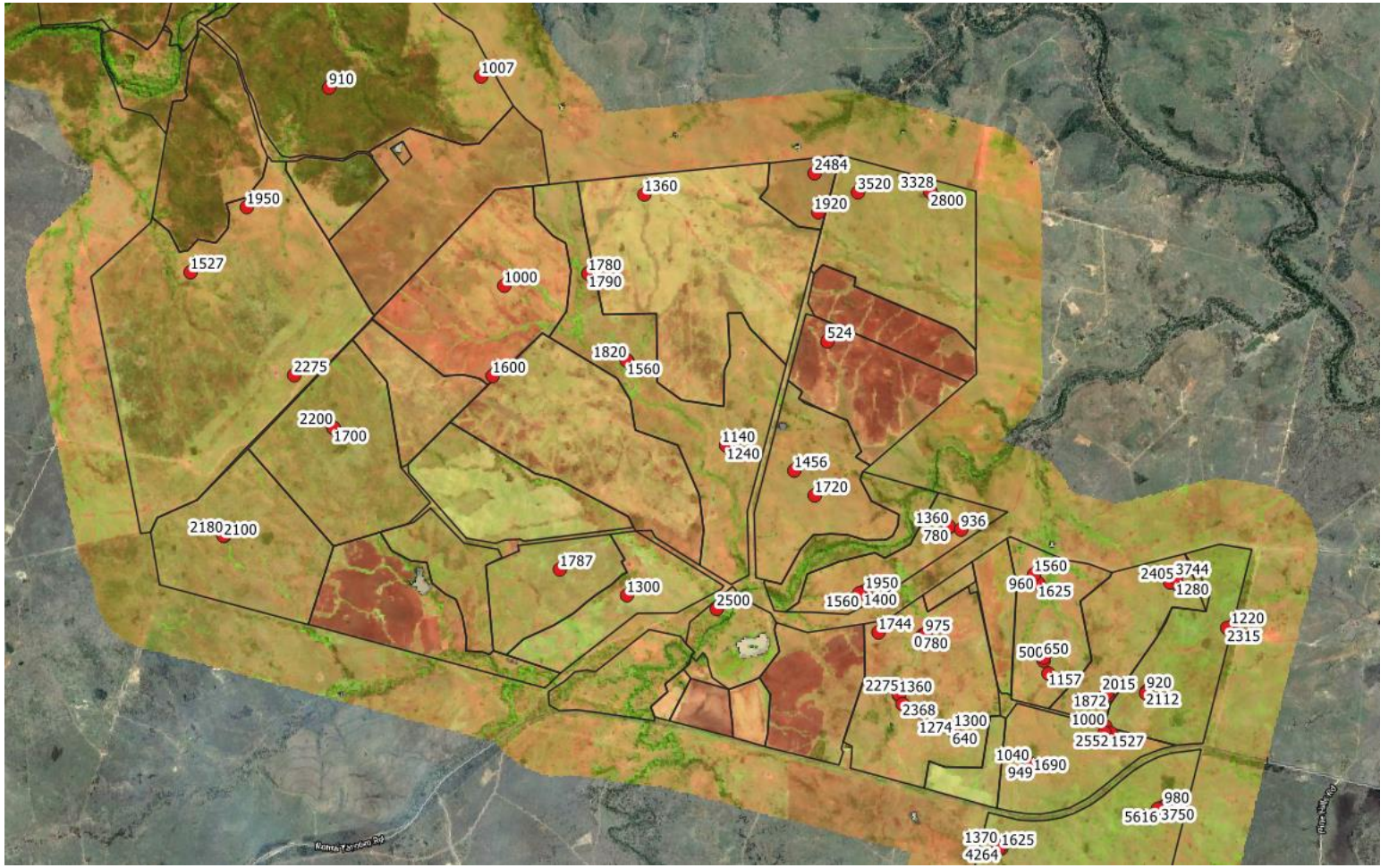


Paddock	Landtype	Hectares	TSDM20200524
Mooramong	Hard gidgee	2722	1655
Mooramong	Jump-ups	1302	2805
Mooramong	Open alluvial plains	1774	1928
Mooramong	Open downs	2050	2356
Mooramong	Pebbly downs	430	1991
	PADDOCK LEVEL	**8278**	**2128**

Intensive and extensive field data collection by Cibo Labs and producers to calibrate and validate predictions

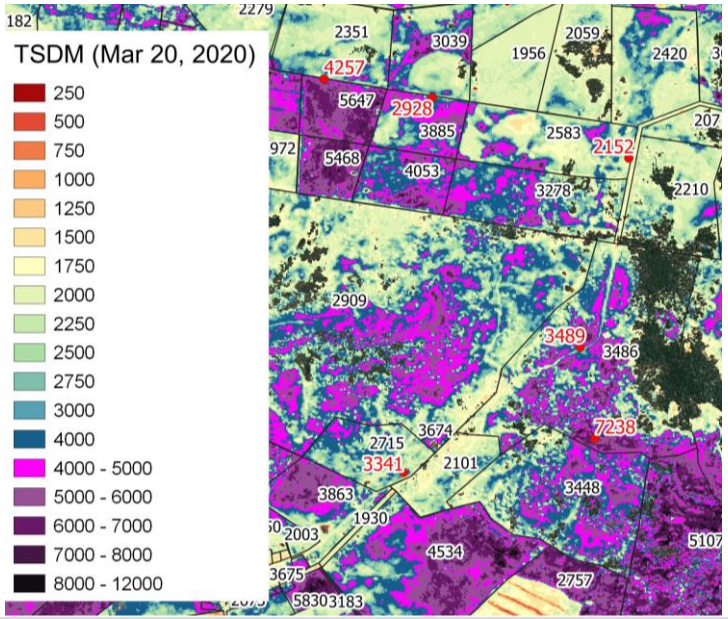


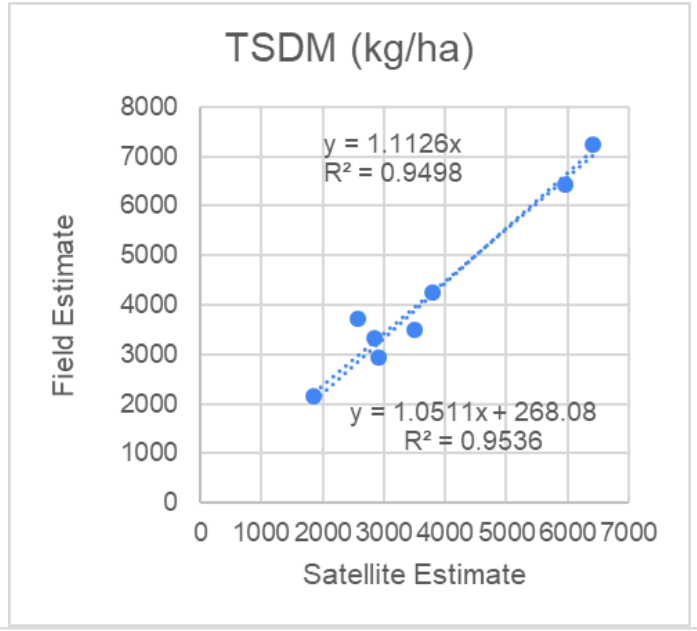




So How Good Are The Biomass Predictions?

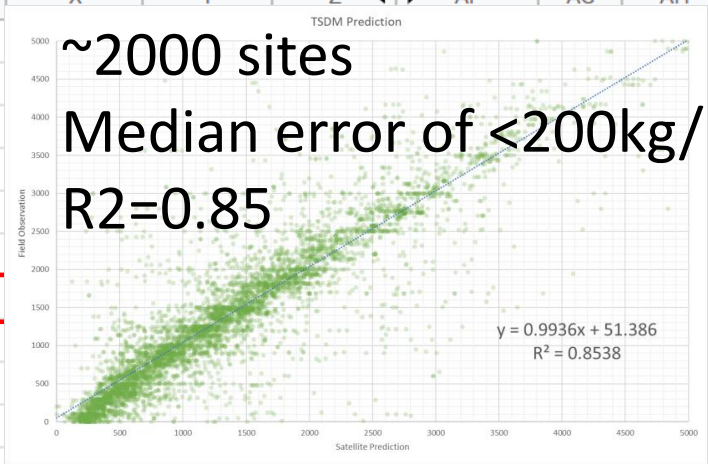
Independent client validation PRIOR to Local calibration





150.678319

	L	M	N	O	P	Q	R	S	T	U	V	W
1	Endtime	Valid	Prop	Paddock	SiteInfol	SiteInfoL	SiteInf	SiteInf	SiteImage	PastureImage	quadrat1	quadrat2
2	04/07/2020 01:19	Yes	Warr	End of Lane	-31.642	150.674	405.58	5	https://cibolabs.a	https://cibolabs.a	5972	1048
3	04/07/2020 02:19	Yes	Warr	Mailboy	-31.639	150.689	539.85	5	https://cibolabs.a	https://cibolabs.a	8320	7244
4	04/07/2020 02:48	Yes	Warr	Mailboy	-31.632	150.688	462.02	5	https://cibolabs.a	https://cibolabs.a	3315	2731
5	04/07/2020 04:23	Yes	Warr	Patersons	-31.617	150.692	421.07	5	https://cibolabs.a	https://cibolabs.a	1980	2070
6	04/07/2020 04:48	Yes	Warr	Sudax	-31.613	150.676	420.37	5	https://cibolabs.a	https://cibolabs.a	3889	1352
7	04/07/2020 05:14	Yes	Warr	Treeless	-31.611	150.668	432.95	5	https://cibolabs.a	https://cibolabs.a	5584	4472
8	04/08/2020 00:24	Yes	Wind	Sth Gangat	-31.658	150.369	377.80	5	https://cibolabs.a	https://cibolabs.a	6200	7100
9	04/08/2020 01:01	Yes	Wind	Sth Windy Ridge	-31.645	150.371	364.43	5	https://cibolabs.a	https://cibolabs.a	4698	4428
10	04/16/2020 01:31	Yes	Warr	Middle Heifer Nth	-31.600	150.698	386.38	5	https://cibolabs.a	https://cibolabs.a	2490	2310
11	04/16/2020 05:37	Yes	Warr	Ryegrass	-31.663	150.678	383.82	5	https://cibolabs.a	https://cibolabs.a	2892	3912

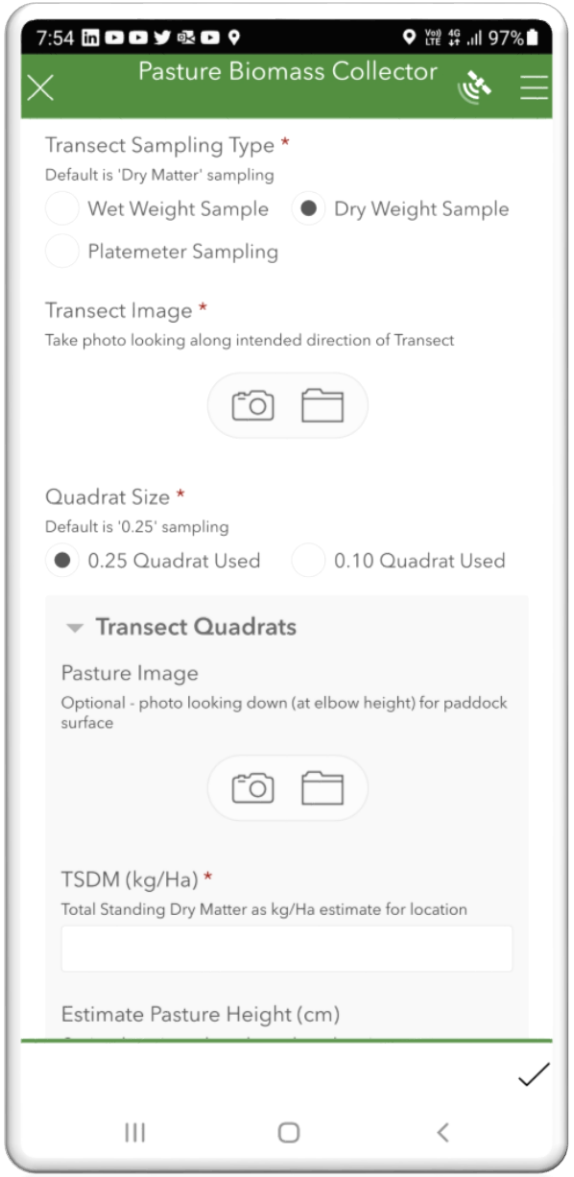


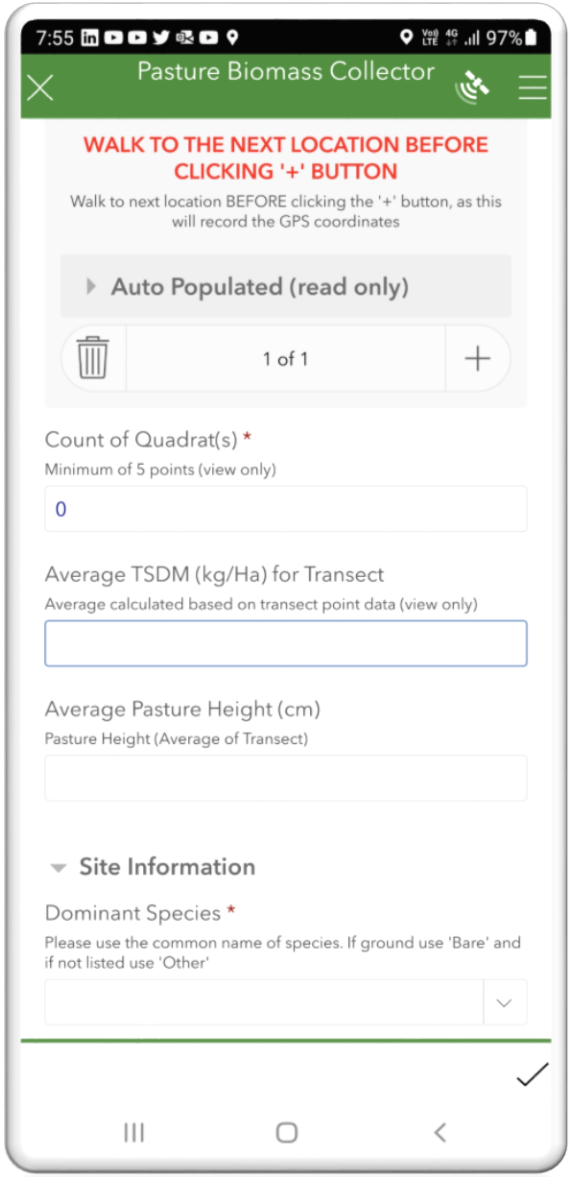
~2000 sites

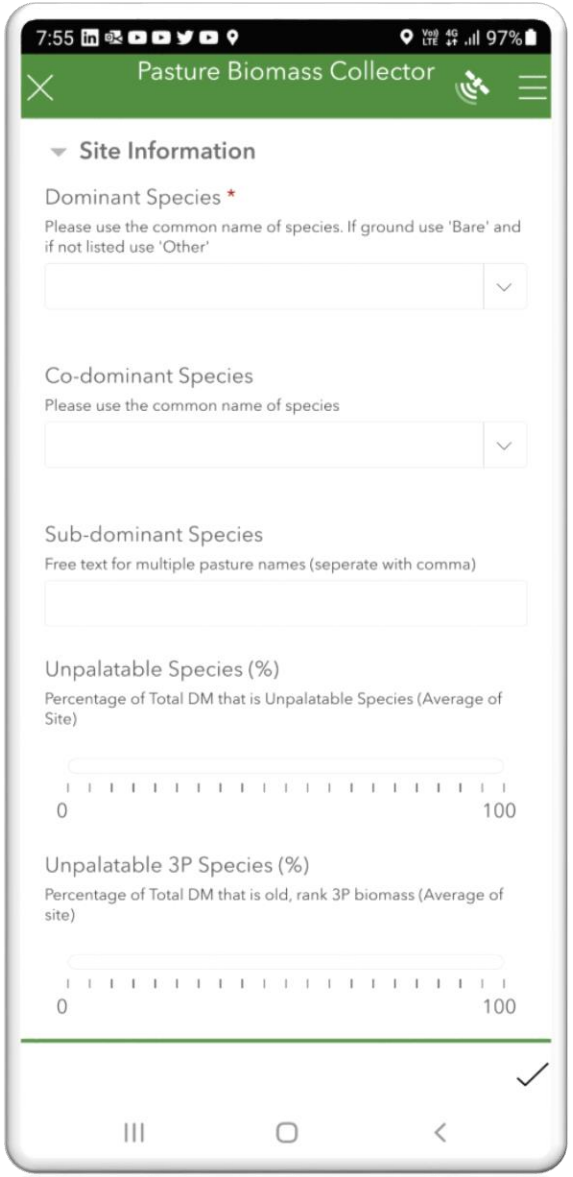
Median error of <200kg/ha

R2=0.85

Publicly Available and Secure Mobile Pasture Apps

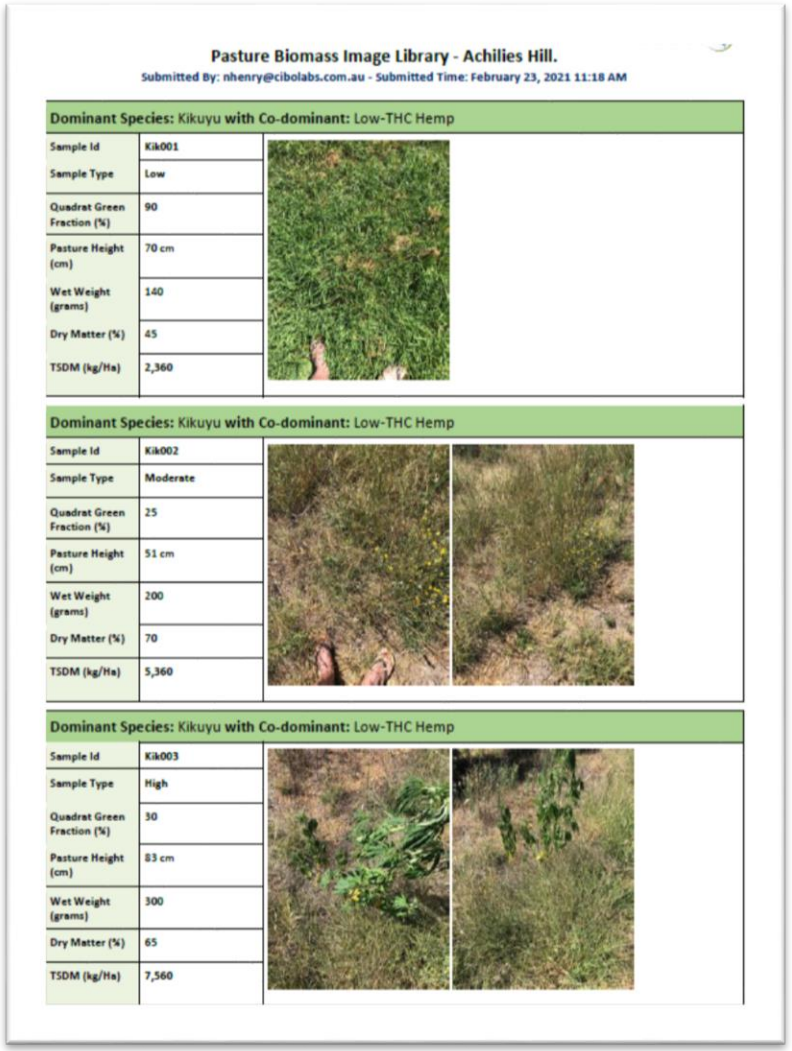






- Available for free
- Data owned by the producer
- Cibo provide secure access to owners data
- Cibo licenced for internal uses and model development.

“Intelligent” photo library being developed



Pasture Biomass Image Library - Achilies Hill.

Submitted By: nhenry@cibolabs.com.au - Submitted Time: February 23, 2021 11:18 AM

Dominant Species: Kikuyu **with Co-dominant:** Low-THC Hemp

Sample Id	Kik001
Sample Type	Low
Quadrat Green Fraction (%)	90
Pasture Height (cm)	70 cm
Wet Weight (grams)	140
Dry Matter (%)	45
TSDM (kg/Ha)	2,360

Dominant Species: Kikuyu **with Co-dominant:** Low-THC Hemp

Sample Id	Kik002
Sample Type	Moderate
Quadrat Green Fraction (%)	25
Pasture Height (cm)	51 cm
Wet Weight (grams)	200
Dry Matter (%)	70
TSDM (kg/Ha)	5,360

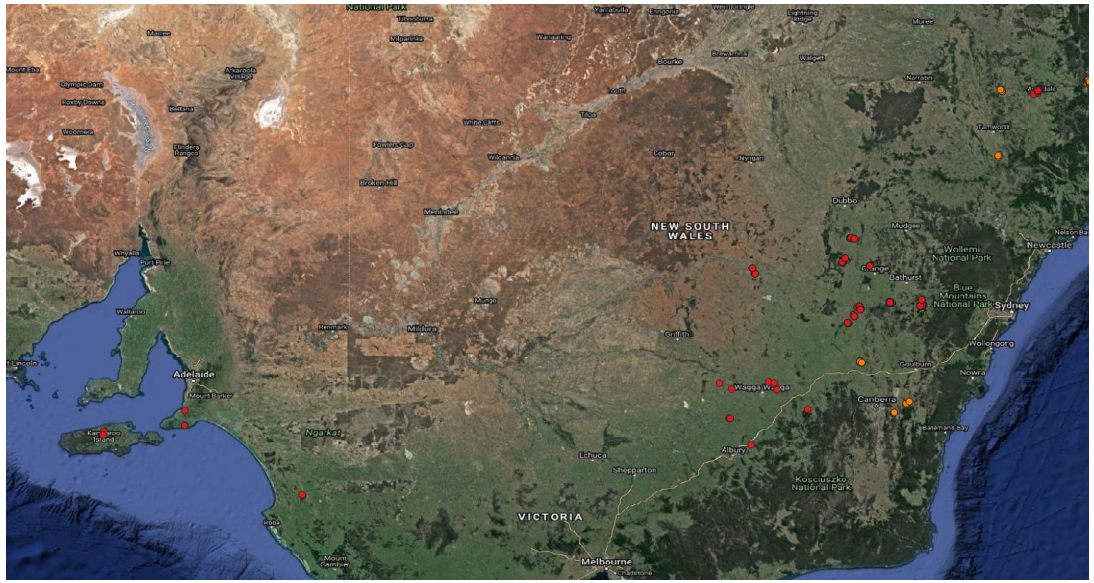
Dominant Species: Kikuyu **with Co-dominant:** Low-THC Hemp

Sample Id	Kik003
Sample Type	High
Quadrat Green Fraction (%)	30
Pasture Height (cm)	83 cm
Wet Weight (grams)	300
Dry Matter (%)	65
TSDM (kg/Ha)	7,560

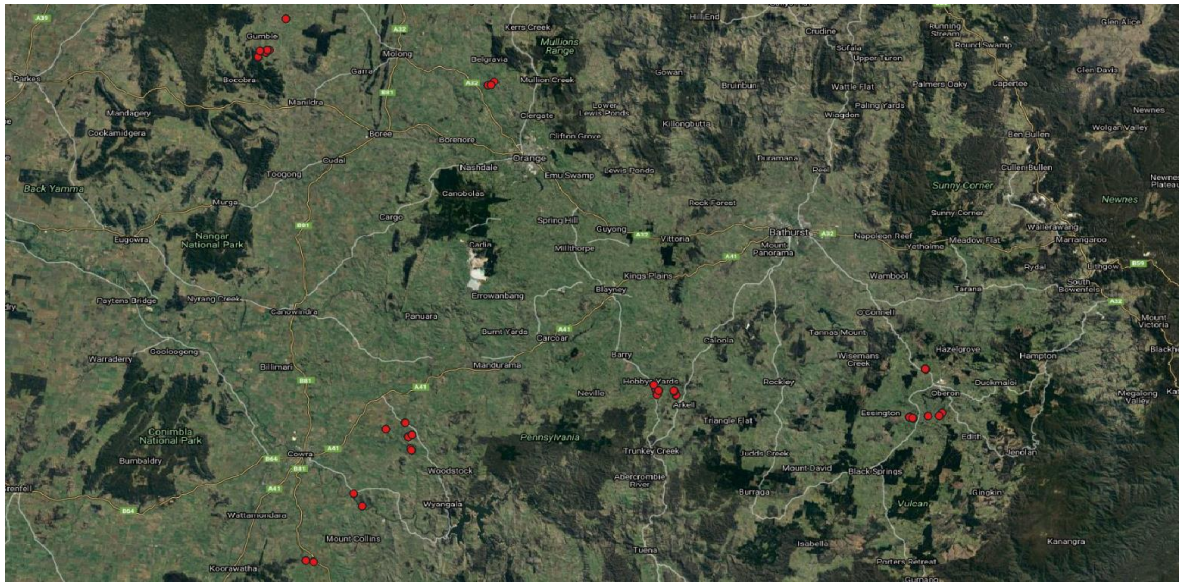
Photo reference in on device

Computer Vision being developed to predict biomass directly from smart device

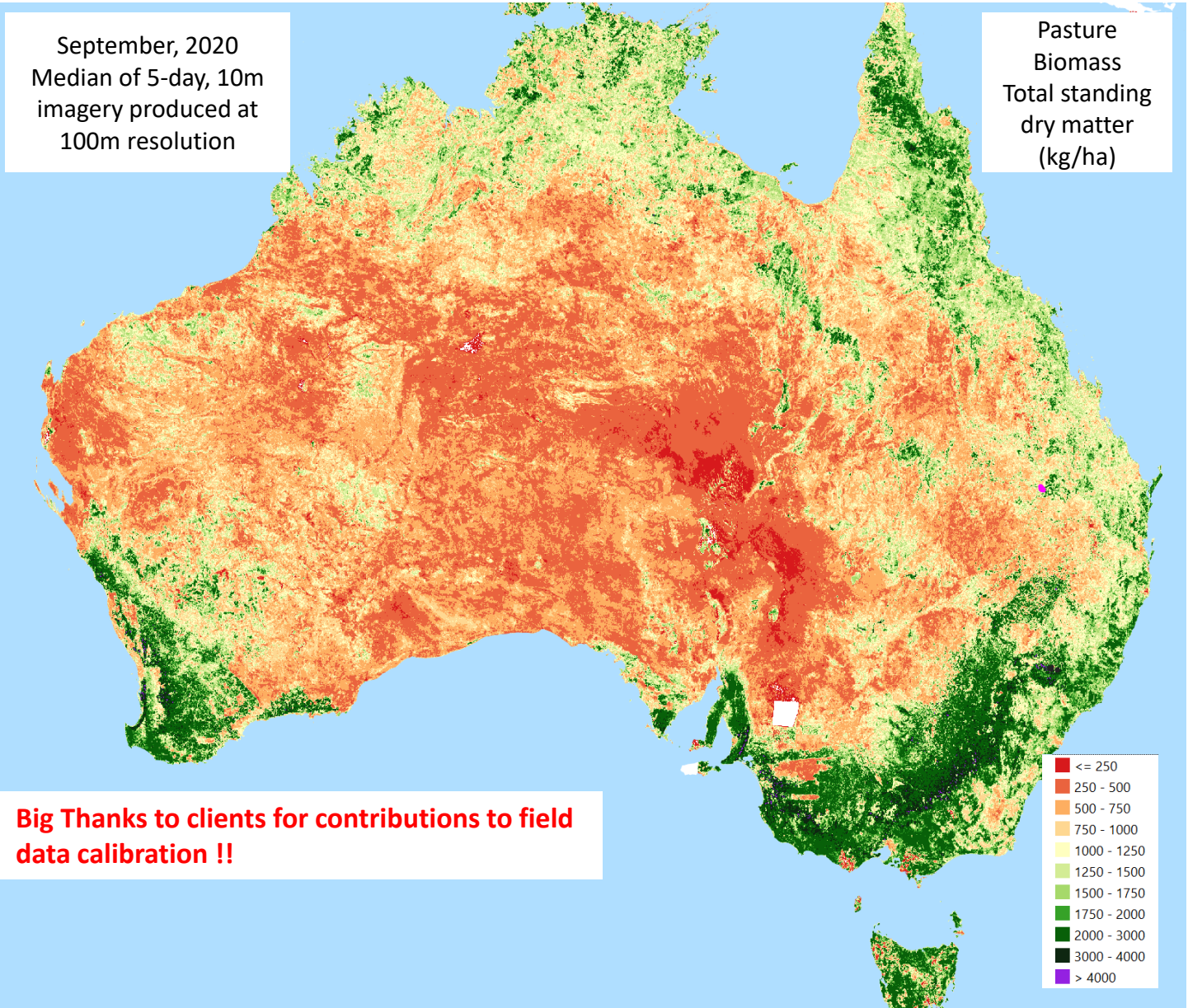
Complete revision of southern model underway



- Southern model currently under-predicting due to “drought data”
- ~1000 additional pasture site collected through collaboration 2018-20, including ~500 during cracker 2020 season
- Integrated northern and southern model planned for mid-2021

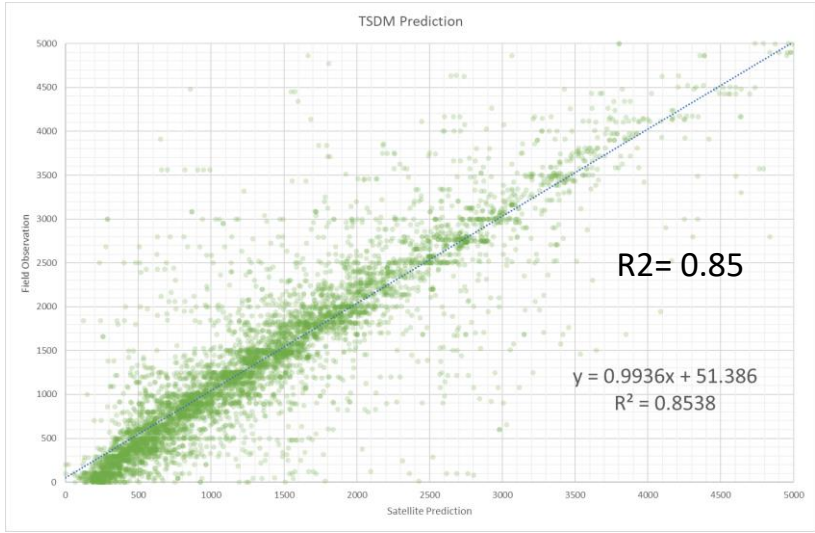


Paddock to Nation Biomass Predictions every month



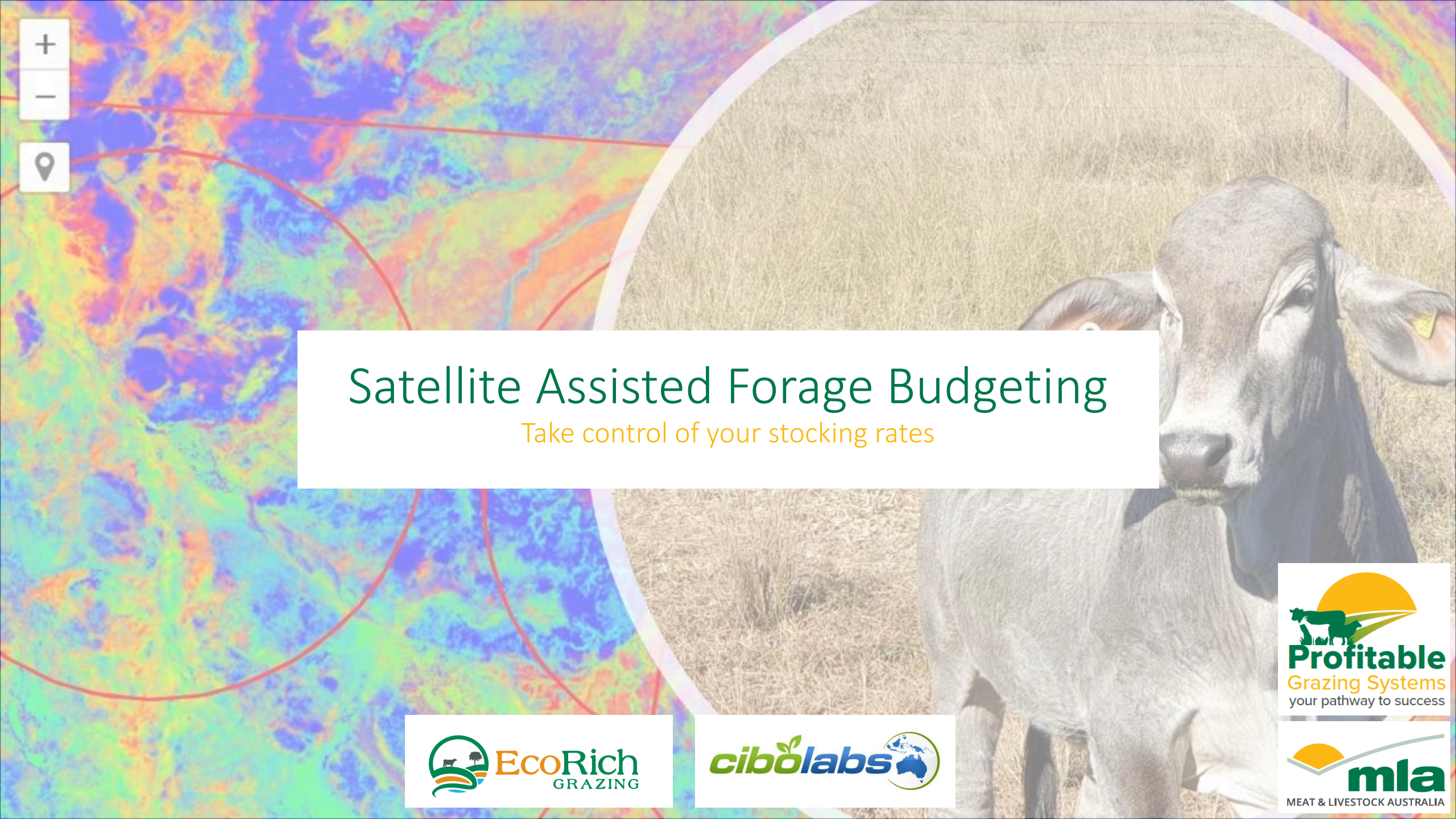
Big Thanks to clients for contributions to field data calibration !!

- ~2000 northern pasture sites
- Sentinel-2, 10 bands + woody density
- 50% of the data held back for cross validation
- Median error of 190kg/ha
- Notice woody cover effects minimised



Satellite Assisted Forage Budgeting

Take control of your stocking rates



EcoRich GRAZING

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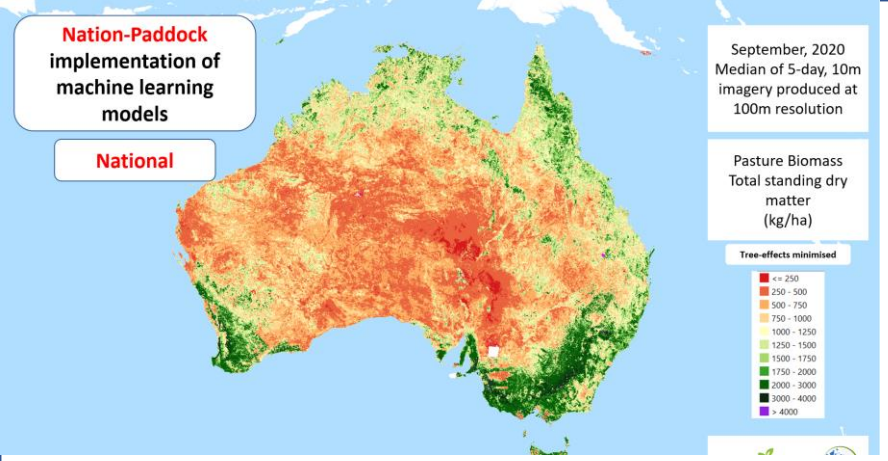
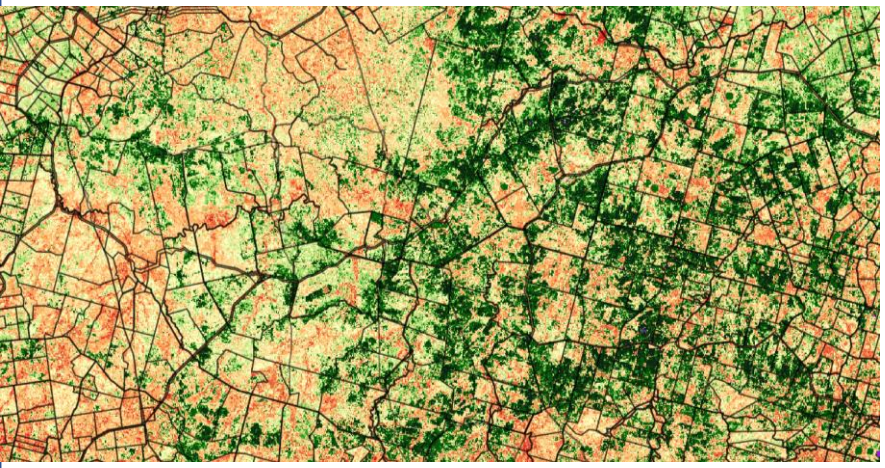
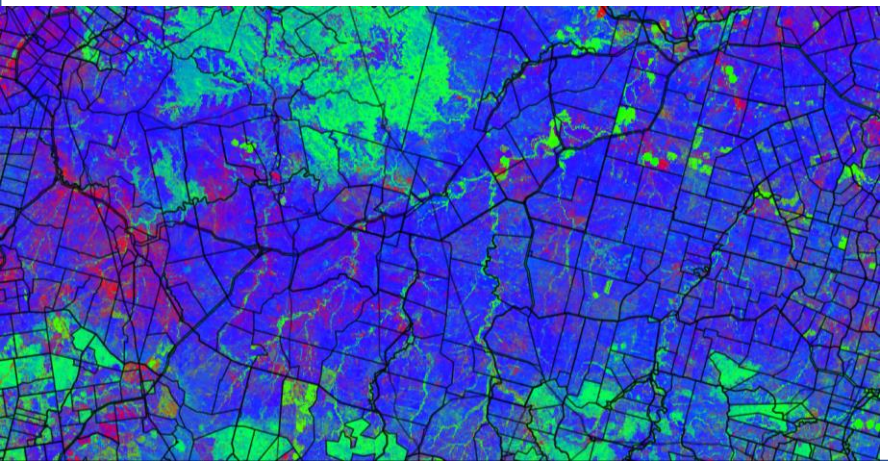
Profitable Grazing Systems
your pathway to success

mla
MEAT & LIVESTOCK AUSTRALIA







Take Home Messages

- We have demonstrated the ability to seamlessly scale from paddock to national levels. Commercial service likely to exceed 50 Mha per week of paddock level predictions.
- National monthly 1ha national biomass and fractional cover products coming in 2021 and has the ability to provide data services to other government platforms.
- On-demand access to RS products for every property in Australia is here through the MyFarmKey. Benchmarking Tree cover, ground cover, carbon potential and pasture biomass.
- MyFarmKey outcomes the limitations of the PIC register and offers immediate value to a producer.
- The old “research paradigms” of often no longer valid – Cibo Labs uses a “living laboratory approach”.
- There are no excuses for not using GPS-based mobile apps.
- Research organisations need to stop using publicly funded research to compete against and duplication industry capabilities that are rapidly developing as largely self-funded commercial services developed in partner with producers. Collaborate…DON”T duplicate.
- Ongoing and increasing collaborative projects focused on both innovation and adoption through B2B collaboration is where value will be generated.
- Still plenty of work to do:
  - Commencing work in pasture quality, land condition and automated land type prediction.
  - Integrated forage budgeting tools
- PGS Satellite Assisted Forage Budgeting program is ready to role out but needs to engage with more with southern providers (post-COVID)
- Expanding carbon and sustainability accreditation products rapidly developing.
- Access to standaised digital farm mapping is a huge barrier to adoption and system integration. **We still need to get the SIMPLE THINGS RIGHT**

Thanks for your time

Phil Tickle
M: 0437593037
E: ptickle@cibolabs.com.au