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# Use of Earth Observation data for enforcement of sustainable agriculture.- good practice from EU Common Agriculture Policy

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Sinergise, a Planet company



Agriculture – essential for people, often detrimental for the nature



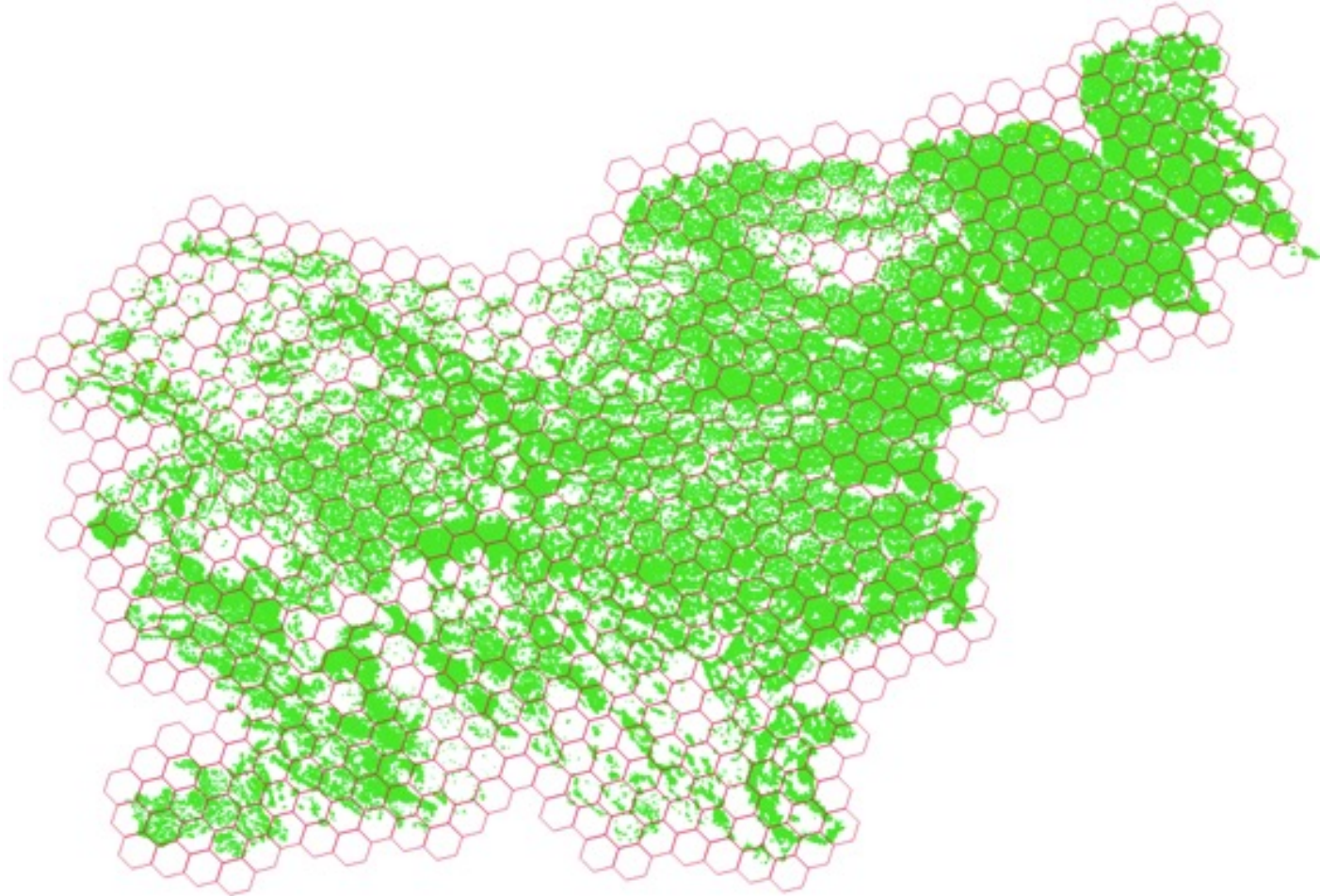


# Agriculture policies ensuring sustainability





# How to efficiently monitor?





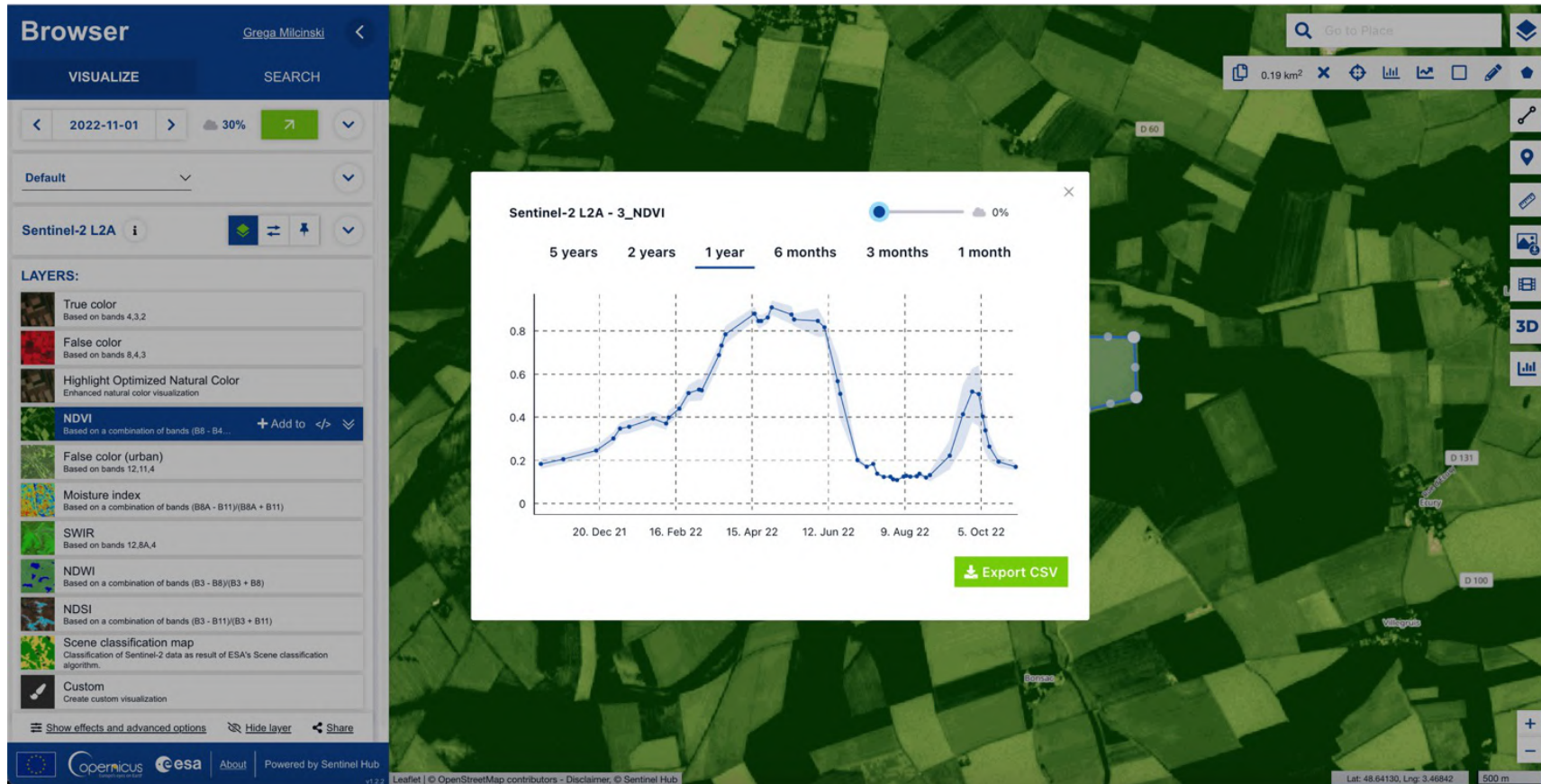
# Satellite imagery – an objective and systematic insight of our planet



Odranci, Slovenia – Planet Fusion



# + Dense time-series show patterns





# Operationalization

Data



ARD stream



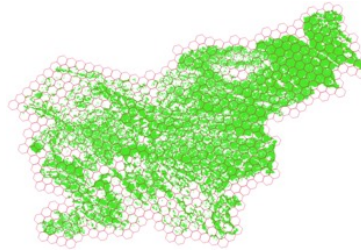
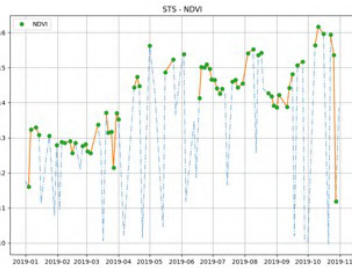
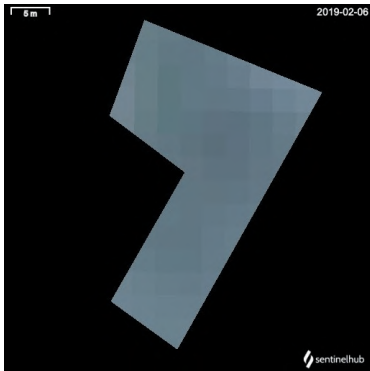
Signals



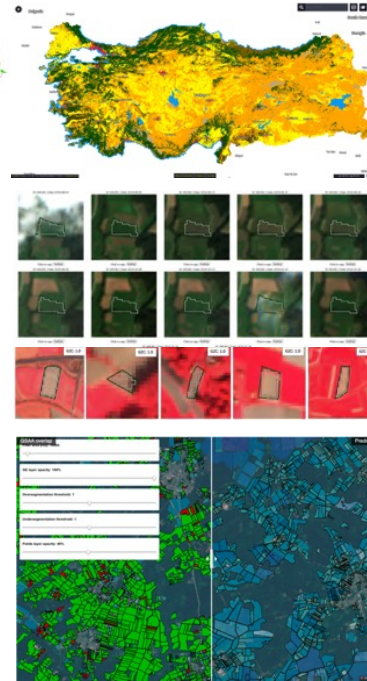
Markers



Solutions



```
{  
  "NDVI": [  
    {  
      "date": "2015-08-30",  
      "basicStats": {  
        "min": -0.5478424429893494,  
        "max": 0.7815912365913391,  
        "mean": 0.147320137875888,  
        "stDev": 0.35443419609590726  
      }  
    },  
    {  
      "date": "2015-07-11",  
      "basicStats": {  
        "min": -0.5127978920936584,  
        "max": 0.8115044236183167,  
        "mean": 0.20168528533031557,  
        "stDev": 0.31436594348376923  
      }  
    }  
  ]  
}
```



# + Parcel boundary delineation



<https://medium.com/sentinel-hub/parcel-boundary-detection-for-cap-2a316a77d2f6>

[https://github.com/sentinel-hub/field\\_delineation](https://github.com/sentinel-hub/field_delineation)





# Peer comparison

2021 - Pregled in urejanje semaforjev po zahtevkih

AKTRP EA (2022-02-15, 16:49) 3fb576e4 test-expert-admin

S2 True color 2021-01-15

Zemljevid Košnja Gola zemlja Scenarij Šifranti

Podatki Sluji Iskanje

Nastavitve

Naloge: 0/12

POLJINA ID	KMRS	RABA	HEMA	KONČNI SEMAFOR	ODLOČITEV MODELA	STROKOVNA ODLOČITEV
6194543	005	1100	AKT	Zeleno	S05 20-12-1	
6262797	005	1100	AKT	Zeleno	S05 20-12-1	
6593222	005	1100	AKT	Zeleno	S05 20-12-1	
6637394	005	1100	AKT	Zeleno	S05 20-12-1	
6637394	005	1100	OMD	Zeleno	S05 20-12-1	
6639194	005	1100	AKT	Zeleno	S05 20-12-1	
6639194	005	1100	OMD	Zeleno	S05 20-12-1	
6769379	005	1100	AKT	Zeleno	S05 40-10-1	
6826557	005	1100	AKT	Zeleno	S05 20-10-1	
6826557	005	1100	OMD	Zeleno	S05 20-10-1	
6879338	005	1100	AKT	Zeleno	S05 20-12-1	
6922683	005	1100	AKT	Zeleno	S05 20-12-1	

Zapisi 1-12, Skupaj: 12

Area	Value
814	15
009	32
809	33
207	43
807	49
808	49
801	51
802	51
222	53
001	56
402	57
026	76
206	86
803	90
812	93
030	96
006	99
020	99
201	99
005	100

Legend for NDVI trends:

- PF NDVI okolica
- PF NDVI okolica (814)
- S2 NDVI okolica
- S2 NDVI
- S2L1C Gola zemlja
- PF Košnja
- S2L1C NDVI povprečje
- PF Gola zemlja

Dogodek	Podrobnosti	Datum	Končni semafor
Model	S05 20-12-1	30. 07. 21	
Model	S05 20-12-1	17. 08. 21	
Model	S05 20-12-1	31. 08. 21	
Model	S05 20-12-1	15. 09. 21	
Model	S05 20-12-1	29. 09. 21	
Model	S05 20-12-1	15. 10. 21	
Model	S05 20-12-1	15. 10. 21	
Model	S05 20-12-1	15. 11. 21	





# Bare soil

2021 - Pregled in urejanje semaforjev po zahtevkih

AKTRP EA (2022-02-15, 16:49) 3fb676e4 test-expert-admin

S2 True color 2021-07-24 Zemljevid Košnja Gola zemlja Scenarij Šifranti

Rezultati PF S2 Št. opažanj v vrstici: 6

Podatki Markerji € EVI Podobnost Razdalja

Marker	Razred	Vrednost
Skupina rab	1	99.0%
Skupina KMRS	3	95.0%
Podobnost	801	40
Razdalja	814	13
Gola zemlja	Opazovanja	17
Košnja	Dogodki	0
NDVI povprečje		0.36
Homogenost		83.6%

0.8  
0.7  
0.6  
0.5  
0.4  
0.3  
0.2  
0.1  
0

Jan 2021 Feb Mar Apr Maj Jun Jul Avg Sep Okt

PF NDVI okolica PF NDVI S2L1C Košnja S2L1C NDVI povprečje PF Gola zemlja S2 NDVI okolica S2 NDVI S2L1C Gola zemlja PF Košnja

Dogodek	Podrobnosti	Datum	Končni semafor
Model	S05 20-10-1	30. 07. 21	
Model	S05 20-10-1	17. 08. 21	
Model	S05 20-10-1	31. 08. 21	
Model	S05 20-10-1	15. 09. 21	
Model	S05 20-10-1	29. 09. 21	
Model	S05 20-10-1	15. 10. 21	
Model	S05 20-10-1	15. 10. 21	
Model	S05 20-10-1	15. 11. 21	

POLJNA ID	KMRS	RABA	HEMA	KONČNI SEMAFOR	ODLOČITEV MODELA	STROKOVNA ODLOČITEV
6605473	801	1100	AKT	Zeleno	S05 20-10-1	
6862200	801	1100	AKT	Zeleno	S05 20-10-1	
6111295	801	1100	AKT	Zeleno	S05 20-10-1	
6180342	801	1100	AKT	Zeleno	S05 20-10-1	
6180342	801	1100	OMD	Zeleno	S05 20-10-1	
6178166	801	1100	AKT	Zeleno	S05 20-10-1	
6178166	801	1100	OMD	Zeleno	S05 20-10-1	
6774509	801	1100	AKT	Zeleno	S05 20-10-1	
6287756	801	1100	AKT	Zeleno	S05 20-10-1	
6287756	801	1100	OMD	Zeleno	S05 20-10-1	
6279647	801	1100	AKT	Zeleno	S05 20-10-1	
6296926	801	1100	AKT	Zeleno	S05 20-10-1	
6302735	801	1100	AKT	Zeleno	S05 20-10-1	
6329890	801	1100	AKT	Zeleno	S05 20-10-1	
6401397	801	1100	AKT	Zeleno	S05 20-10-1	
6401397	801	1100	OMD	Zeleno	S05 20-10-1	
6410154	801	1100	AKT	Zeleno	S05 20-10-1	
6550933	801	1100	AKT	Zeleno	S05 20-10-1	
6573971	801	1100	AKT	Zeleno	S05 20-10-1	
6577003	801	1100	AKT	Zeleno	S05 20-10-1	
6577003	801	1100	OMD	Zeleno	S05 20-10-1	
6601999	801	1100	AKT	Zeleno	S05 20-10-1	
6665534	801	1100	AKT	Zeleno	S05 20-10-1	
6693061	801	1100	AKT	Zeleno	S05 20-10-1	
6720571	801	1100	AKT	Zeleno	S05 20-10-1	
6769640	801	1100	AKT	Zeleno	S05 20-10-1	
6771916	801	1100	AKT	Zeleno	S05 20-10-1	
6887683	801	1100	AKT	Zeleno	S05 20-10-1	
6841560	801	1100	AKT	Zeleno	S05 20-10-1	
6666767	801	1100	AKT	Zeleno	S05 20-10-1	
6907708	801	1100	AKT	Zeleno	S05 20-10-1	
6920633	801	1100	AKT	Zeleno	S05 20-10-1	
6920633	801	1100	AKT	Zeleno	S05 20-10-1	

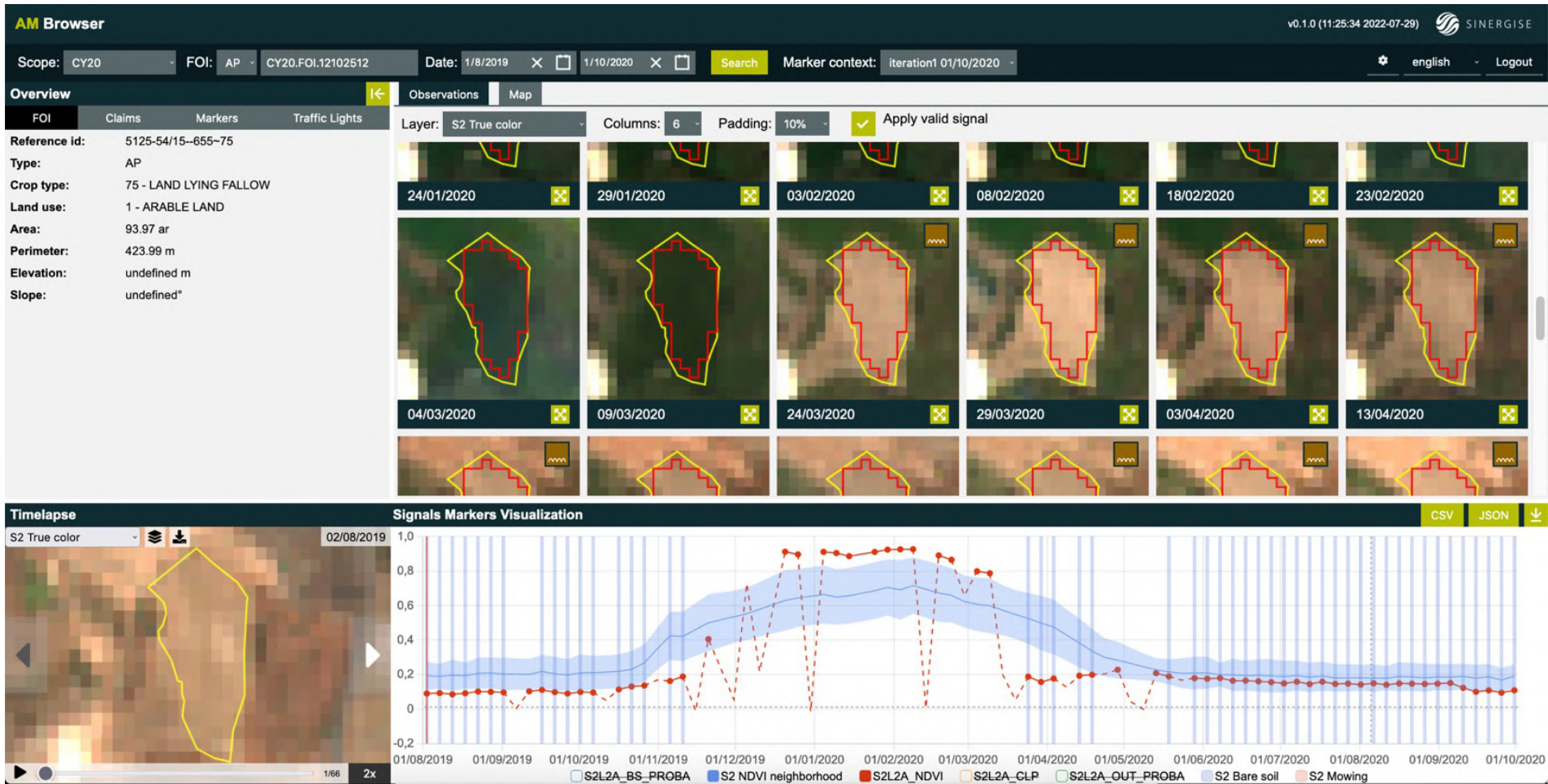
✓ Zeleno X Rumeno X Rdeče → Brez odločitve

RAZLOG SPREMEMBE SEMAFORJA





# Land use and Crop group classification



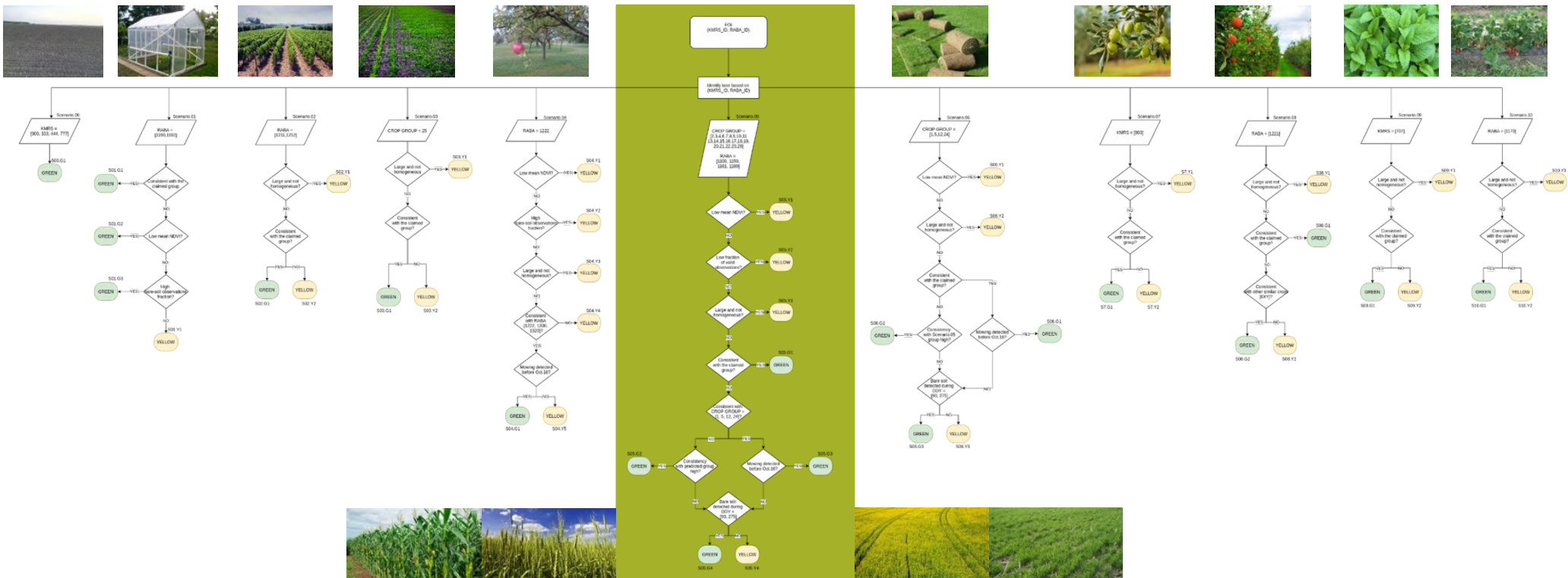


# Built-up area marker





# Rules-based decision making process



# + Communication with farmers

**Stanje semaforja po poljih (10/10)**

Iskanje

Filtriraj po stanju semaforja:

! (1) ? (3) ✓ (6) ✕ (0)

Glavni posevek	Prezirnimi posevek	Neprezirnimi posevek
7808205 - trajno travinje - 1 ha 49 ar GERK 1727672 - ROŽMANOVO	2 !	
7808204 - mešane sadne vrste - 5 ar GERK 1714692 - ROŽMANOVO	2 ?	
7808209 - trajno travinje - 1 ha 76 ar GERK 1727664 - DOMA	2 ?	
7808210 - tritikala (ozimna) - 37 ar GERK 1727673 - GRABEN	2 ?	
7808206 - koruza za zrnje - 17 ar GERK 1737696 - VRBINA	2 ✓	
7808207 - trave - 62 ar GERK 1737698 - POD TRSJEM	2 ✓	
7808208 - vinska trta - 11 ar GERK 3069925 - ROŽMANOVO	2 ✓	
7808211 - trajno travinje - 32 ar GERK 1727671 - GRABEN	2 ✓	

**Podrobnosti poljne: Opažanja** Komunikacija (1)

Vrsta rabe je skladna s prijavo.	NE
Površina je homogena.	NE
Površina je bila obdelana do 15.10.	DA
Na površini ni zaznati elementov nekmetijske rabe.	DA
Površina je bila pokošena do 15.10.	DA

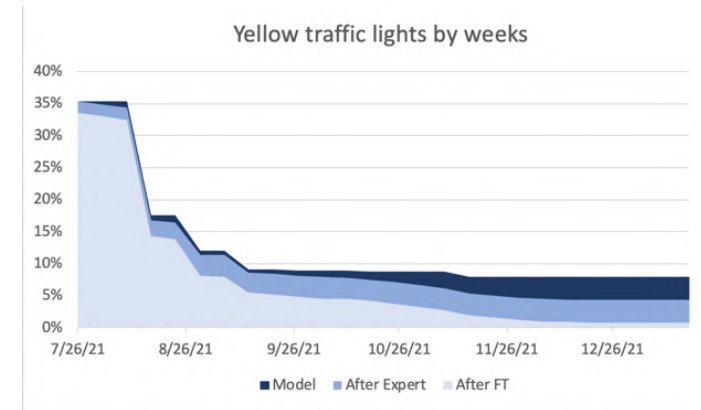
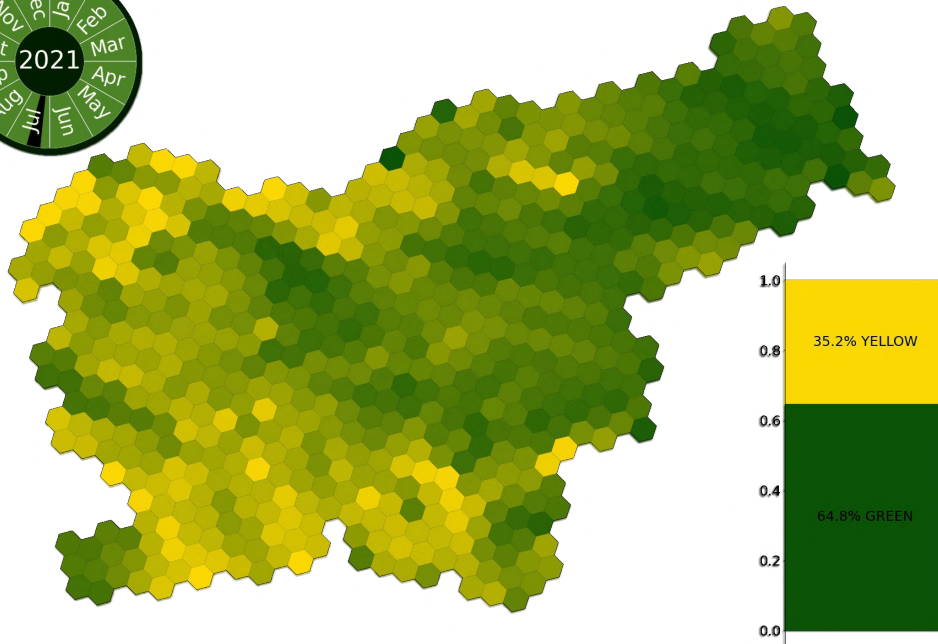
Ugotovitve so rezultat avtomatskega zaznavanja sprememb na površini tekom tekočega koledarskega leta.

Sentinel2 - True color 02. 01. 2022

SINERGISE v1.4.0 (8/26/2022, 10:30:23)



# Ongoing monitoring



# + Evolution – vertical and horizontal

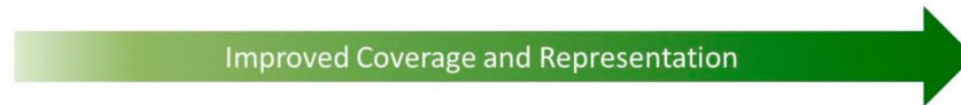


Land Monitoring

## Accuracy and coverage in LULUCF



<b>Tier 3</b> High res. data (e.g. model)	Not applicable	Modelled data combined with LUC matrix (not necessarily spatially dis-aggregated)	Geo-information at high-resolution, detailed time series, country-specific disaggregated data based on inventories and/or models
<b>Tier 2</b> Country specific values	National area statistics, combined with country-specific values – typical 1 <sup>st</sup> improvement	Annual LUC stats, combined with country-specific values	Geo-information, time series, country specific values – good coverage, detailed analysis
<b>Tier 1</b> IPCC default values	National area statistics, combined with IPCC default values – basic entry level	Annual (or annualised) LUC stats presented as national matrix – applied using default IPCC values	Geo-information, time series, default values – weak, but better than App 1 and 2
	<b>Approach 1</b> National statistics	<b>Approach 2</b> Land Use Change matrix	<b>Approach 3</b> Geo-tracked



Source: COM(2016) 479 final







Thank you.

