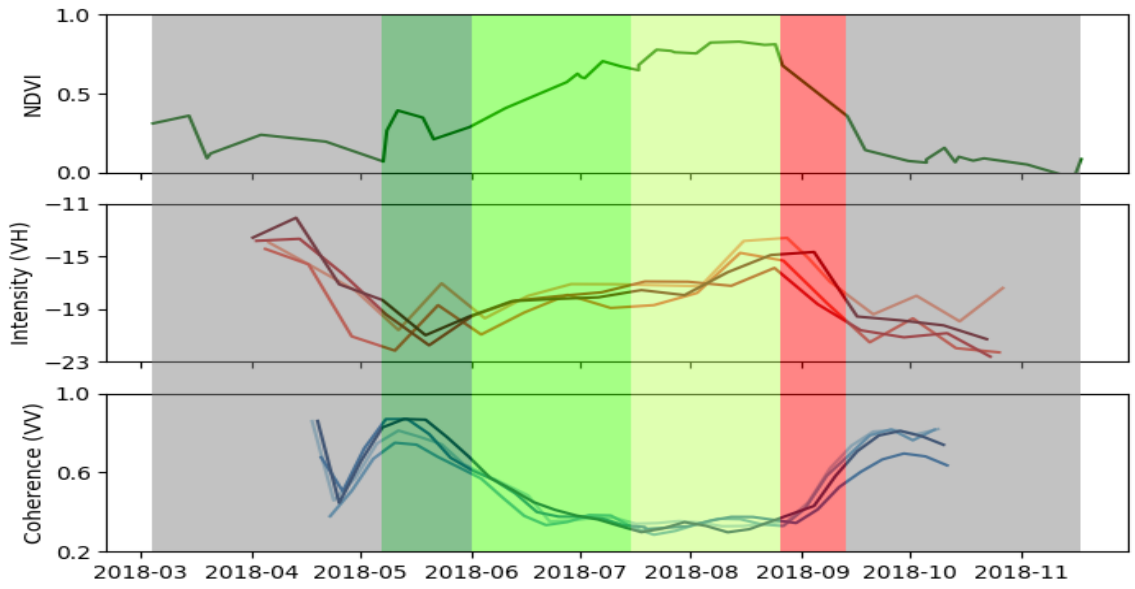

Netherlands Enterprise Agency

Lessons learned SEN4CAP 2017-2021

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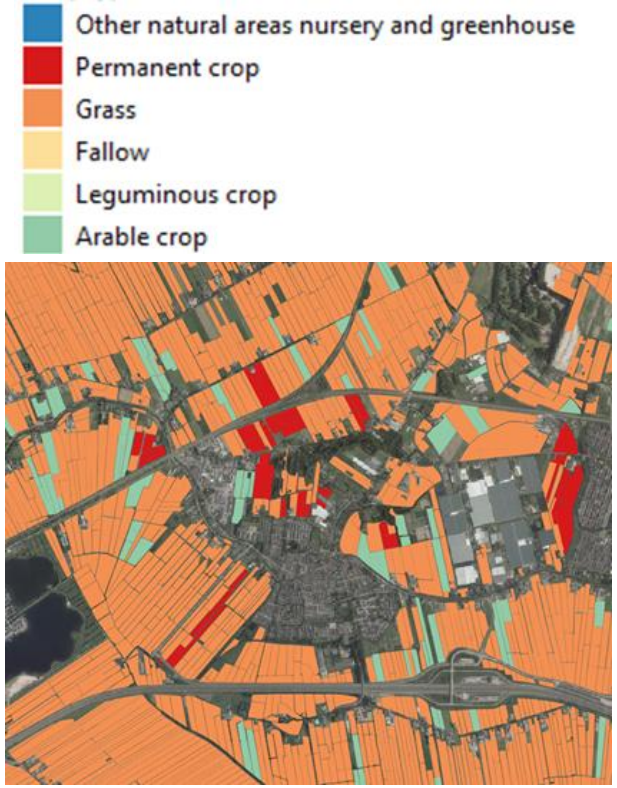
Content

- Lessons learned
  - Crop classification for super classes
  - Mowing detection
  - Harvest and catch crop monitoring
  - Visualization tool
- Experiences with SEN4CAP-system
- Experiences with support from the SEN4CAP-team

Crop classification for superclasses

- 2 look-up tables
  - Normal crop classification
  - Classification in 5 superclasses
    - Arable crop
    - Grass
    - Leguminous crop
    - Fallow
    - Permanent crop
- crop classification with 1st 5 crops + confidence levels



Conclusion/lessons learned: Classifying with superclasses causes less classified parcels with low confidence. It is possible to adapt the results of the L4A getting the 1st 5 crops (with confidence level)

Crop classification for superclasses

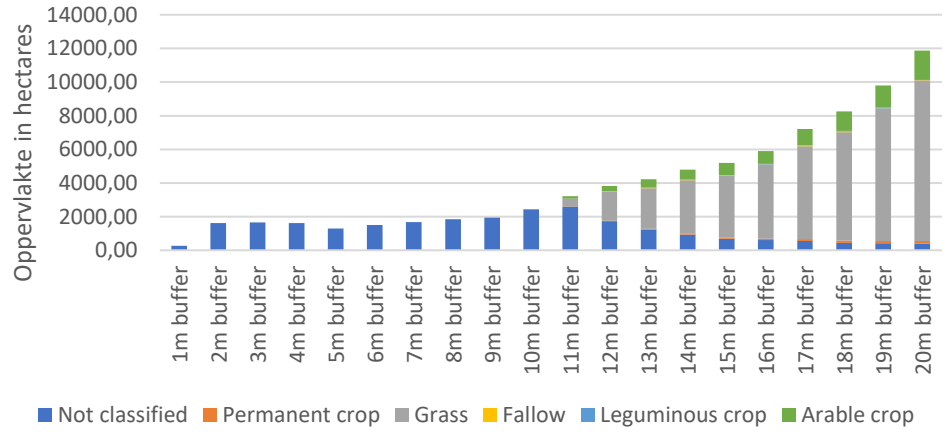
All parcels with Conf. > 0,5 (area)

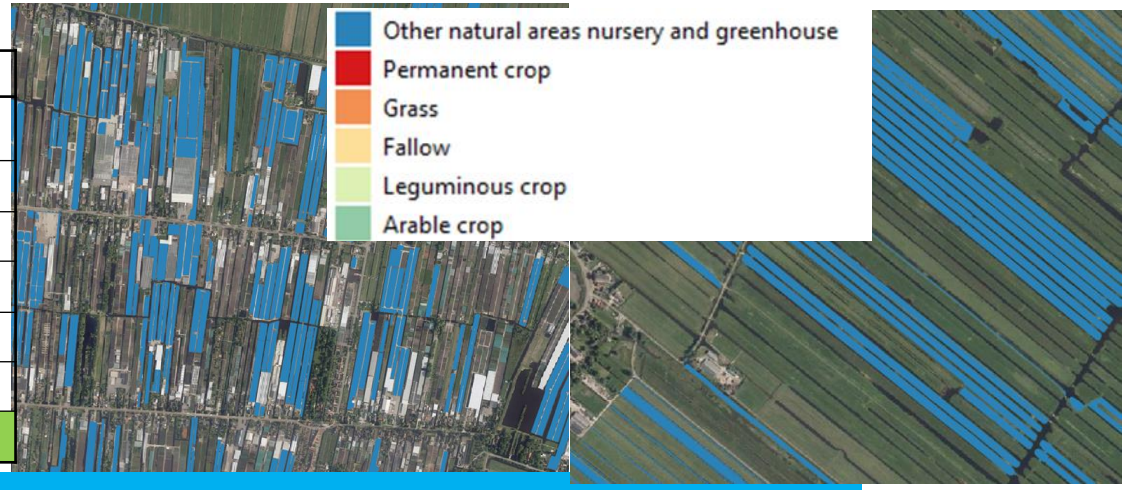
declared \ found	Not classified	Permanent crop	Grass	Fallow	Leguminous crop	Arable crop
Not classified	0,00					
Permanent crop		11484,70	5827,00		0,29	2197,39
Grass		55,28	966654,74		9,69	18986,64
Fallow			145,95	73,38		355,57
Leguminous crop		2,84	3402,14		1840,56	11687,80
Arable crop		28,27	9013,95		1,09	724613,30

All parcels (area)

decrared \ found	Not classified	Permanent crop	Grass	Fallow	Leguminous crop	Arable crop
Not classified	97923,30					
Permanent crop		13234,88	6969,35		0,29	2877,29
Grass		99,83	968968,32		16,70	20997,88
Fallow		5,06	236,03	596,67		605,73
Leguminous crop		4,42	3961,62		3442,68	12649,40
Arable crop		148,82	10974,73		1,09	727510,31

effect widt of parcel on classification (area)





Conclusion: Classifiing with superclasses causes less not classified parcels. In perc. most not classified parcels are narrower than 20 m.

Mowing detection

- We tried to tackle this detection problem: We see 60.000 parcels with 1st mowing event in January. 8800 have a conf. Level of 0,7 and more!
- In a proof of concept, we investigate whether we can detect fewer incorrect mowing moments and pick up real mowing moments better. We do this by combining data:
  - - Weather conditions
  - - Combine radar and optical
- We use the results from other proofs of concept:
  - -heterogeneity
  - - FOI analysis
- We learned from the approach and clarification to combine S1 and S2 results of SEN4CAP

Conclusion: Results trigger to search for solutions. On application level for basic payment scheme: quality might be sufficient. Results are becoming more and more satisfying at marker level.
Dutch PA needs good quality at marker level to be able to use it for other requirements than BPS and to convince farmers

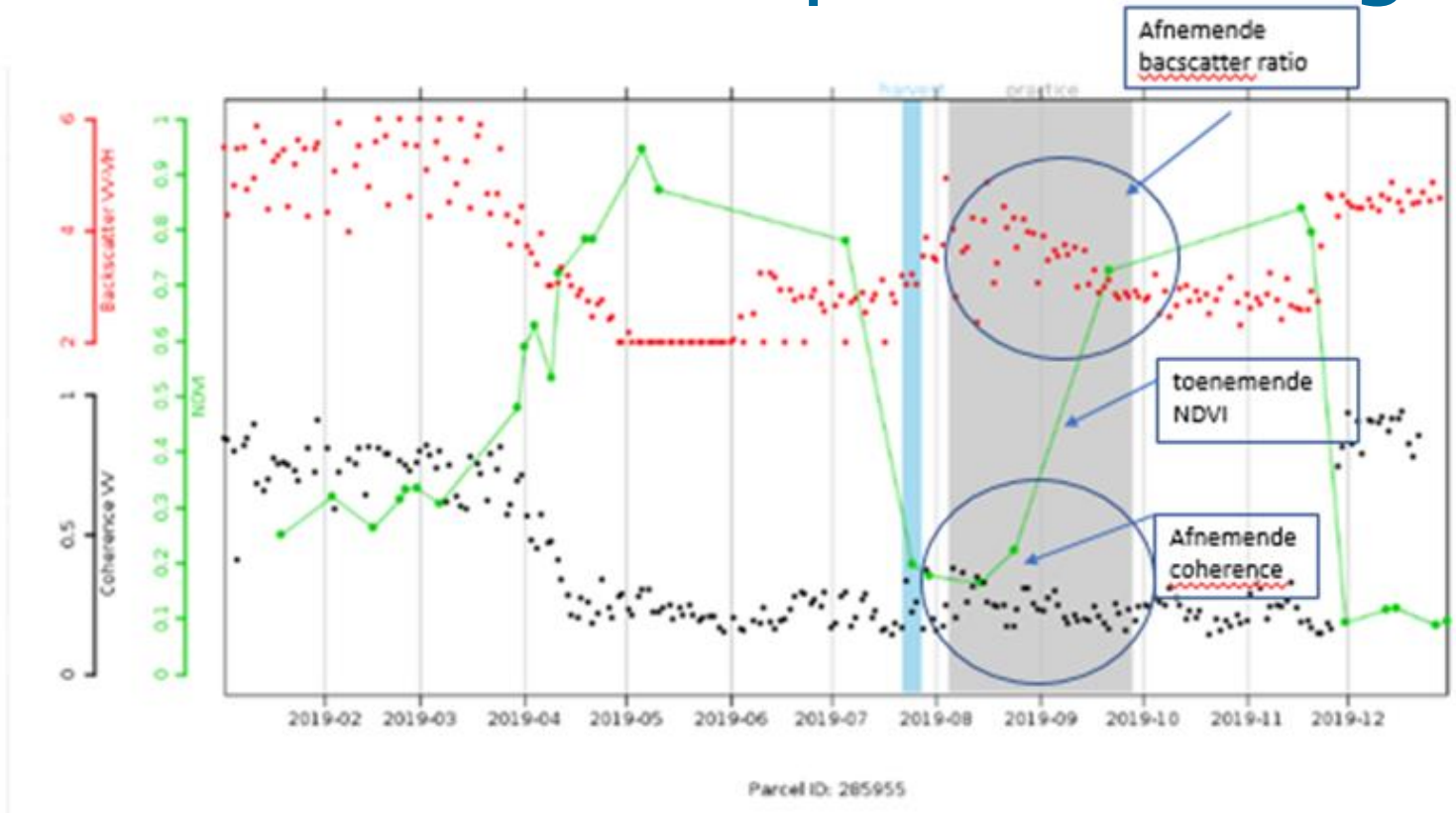
Harvest and catch crop monitoring

- the results of SEN4CAP have been the start of a further refinement of the monitoring of catch crops with the combination of radar and optical.
- We made a report of how to use and interpret radar indices
- Different research populations, among others:
  - Catch crops = grass
  - Early vs late catch crops
  - Situations when field visits results differ from radar indices
  - Catch crops as undersowing vs. catch crop after harvest main crop

M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
NA	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE

Conclusion/ lessons learned: better understanding of radar indices and how to use it for detecting catch crops

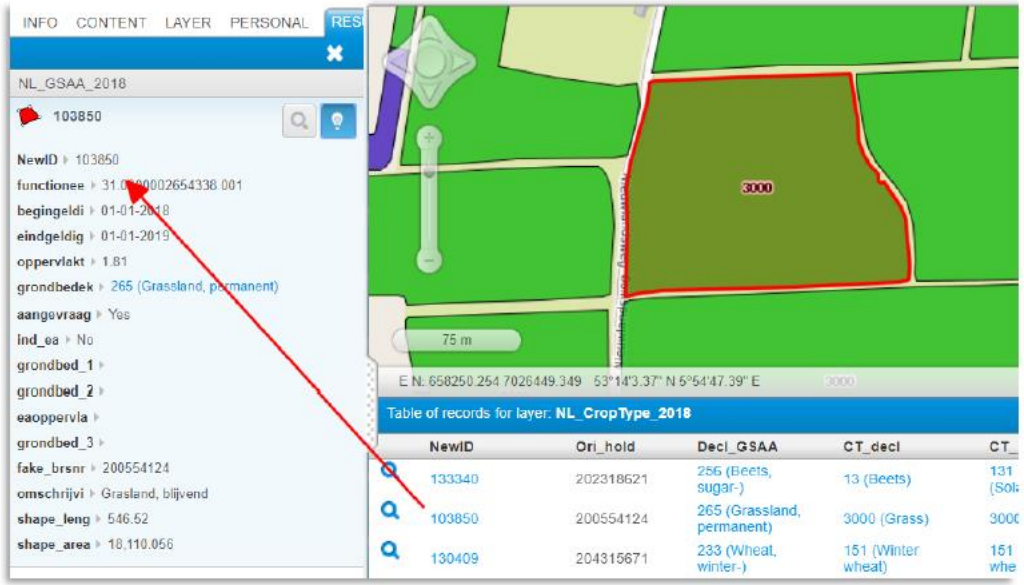
Harvest and catch crop monitoring



Conclusion/lessons learned: better interpretation of radar indices

Visualization tool

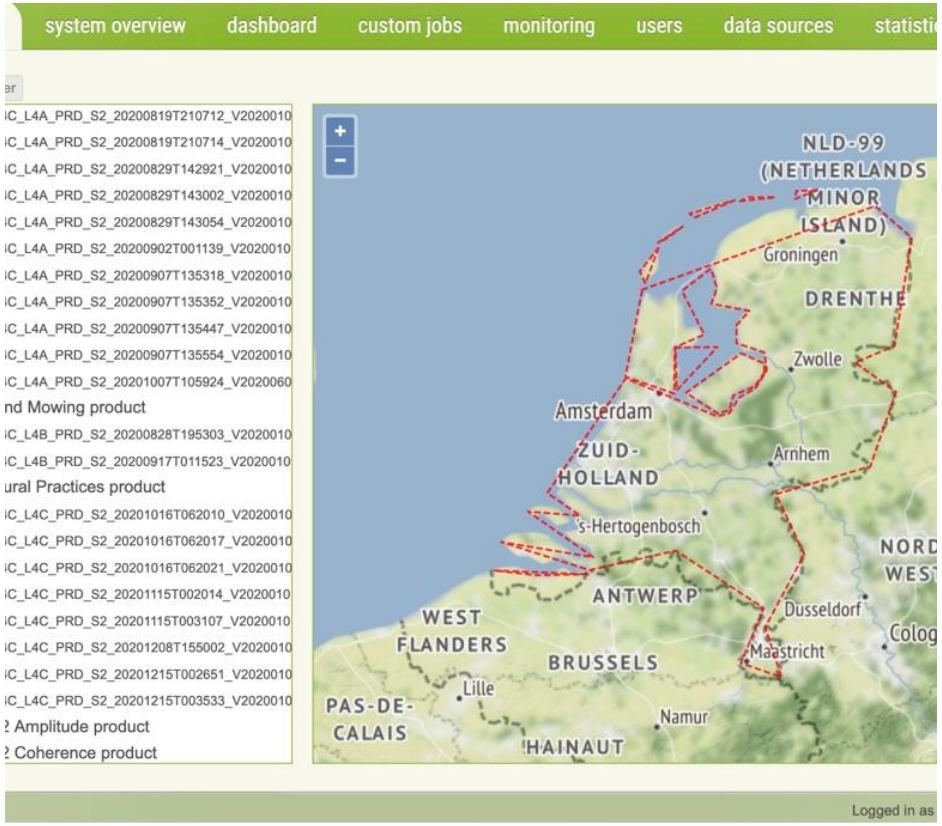
- Corresponding images and curves of indices make the result a lot clearer. We have not been able to gain enough experience with this within SEN4CAP.
- In one case we explicitly requested and received those results in curves of indices. This has led to a solution of a farmer's objection.



Conclusion/lessons learned: a viewer option attached to results monitoring is undispensible

Experiences with SEN4CAP system

- This was the goal of 2020: learn how to run the algoritms of SEN4CAP by ourselves
- A lot of expert-knowledge is needed among others to create all necessary input files: LUT's, config tables…
- insufficient storage capacity on the SEN4CAP vm resulted in temporary no downloading of images and therefore incomplete results



Conclusion/ lessons learned: The system is quite user friendly and we succeeded in running the algoritms, but we needed support at many cases

Experiences with support from SEN4CAP team

- The support as we have experienced it was good. We received detailed answers to all questions for clarification.
- The support to help operate the system was excellent. That support was really necessary.

SEN4CAP Training in NL

Conclusion/ lessons learned: very good experiences with the support that is provided. Also on the part of the paying agency a lot of expertise is required to be able to run a system like that of SEN4CAP.