

## A PERMANENT PASTURE LAYER BASED ON OPEN DATA

The creation and monitoring of a permanent pasture layer

20<sup>th</sup> of November 2014, Marcel Meijer



### Outline

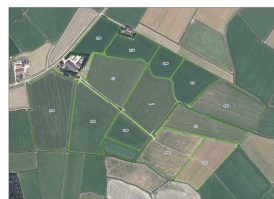
- Open Data in the Netherland
- Greening elements
- Calculating permanent grassland
  - Alphanumeric/declared
  - Spatial
- Difficulties
- Monitoring permanent grassland



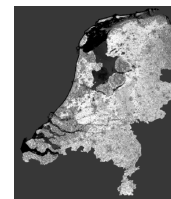
## Open Data in the Netherlands



Greep uit de beschikbare open PDOK services



crop parcel data



satellite data



## www.groenmonitor.nl

**Groenmonitor**

Home Nieuws Groenindex Meer info Data Contact

**Laatste nieuws**

- Nieuwe webiste is live!**  
06 March 2014  
De nieuwe Groenmonitor website is live en wordt donderdagmiddag 6 maart gepresenteerd op de Open...  
[meer](#)
- Ijs- en schaatscondities Oost-Groningen**  
29 January 2014  
Oldambtmeer (figuur 1 en 2) Het Oldambtmeer nabij de Blaauwe Stad ligt nog voor de helft open.... [meer](#)
- Uiterwaarden overstromen in de zomer**  
09 June 2013  
De hevige en aanhoudende regenval in Zuid-Duitsland heeft er voor gezorgd dat de wateraanvoer van... [meer](#)

[De bollen staan weer in bloei](#)  
[Heidebrand op de Veluwe](#)  
[In April nog ijs aanwezig in de grote meren](#)

[Meer nieuws](#)

**Laatste beeld**

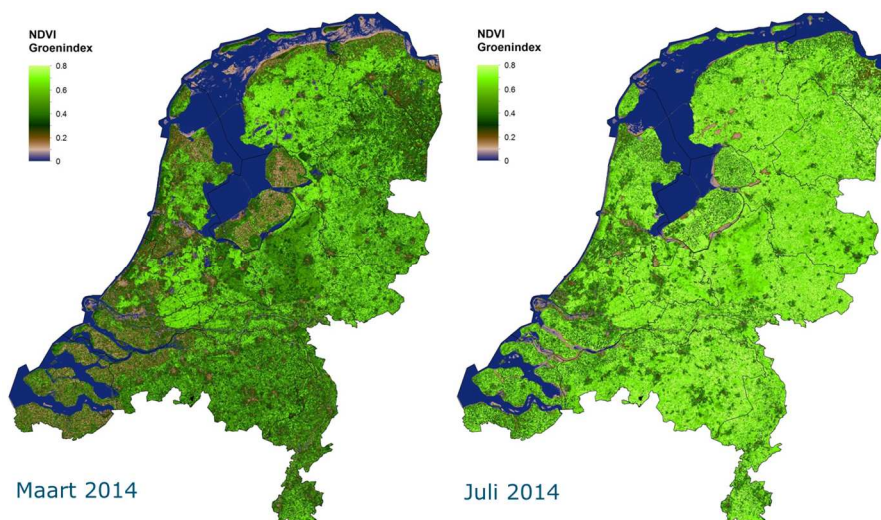
**Over de Groenmonitor**

De groenmonitor geeft de actuele vegetatiekaart van Nederland weer, welke verkregen is uit satellietbeelden. Voor onbewolkte (gedeslees van) satellietbeelden wordt de groenindex (voor de kenners onder ons: de NDVI groenindex) berekend. De groenindex is een indicator van de hoeveelheid groene biomassa met een waarde tussen de 0 en 1. De groenindex waarden kunnen "vertaald" naar landbouwkundige processen of natuurontwikkeling over de seizoenen. Zo kun je per perceel de gewasontwikkeling volgen.

[about](#) [disclaimer](#) [log in](#)



## Biomass index for the Netherlands



ALTEERRA  
WAGENINGEN UR

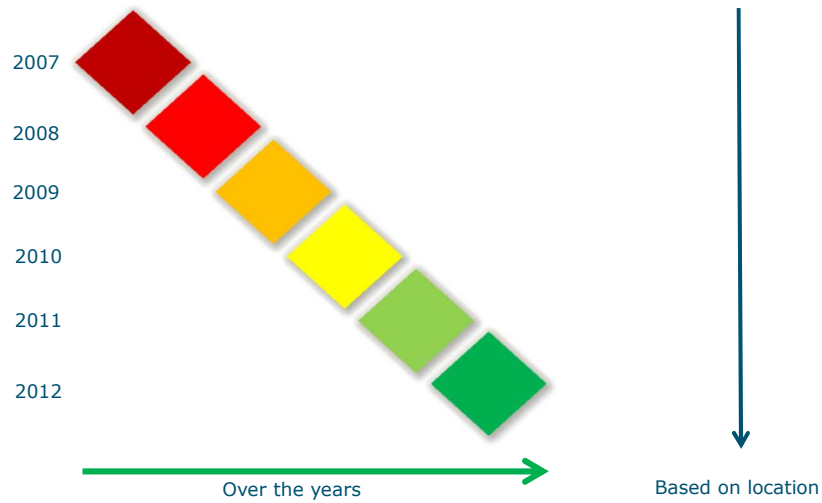
## Greening elements

The 3 basic measures foreseen are:

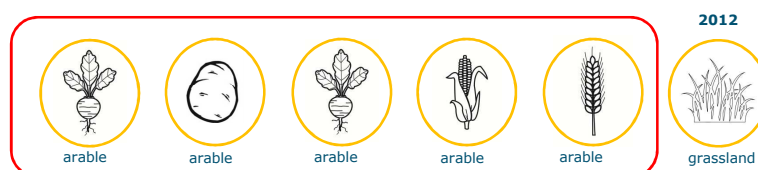
- maintaining **permanent grassland**; and
- **crop diversification** (a farmer must cultivate at least 2 crops when his arable land exceeds 10 hectares and at least 3 crops when his arable land exceeds 30 hectares. The main crop may cover at most 75% of arable land, and the two main crops at most 95% of the arable area);
- **maintaining an “ecological focus area” of at least 5% of the arable area of the holding** for farms with an area larger than 15 hectares (excluding permanent grassland) – i.e. field margins, hedges, trees, fallow land, landscape features, biotopes, buffer strips, afforested area. This figure will **rise to 7%** after a Commission report in 2017 and a legislative proposal.

ALTEERRA  
WAGENINGEN UR

## Calculating the ratio of permanent pasture



## Alphanumeric analysis



Use of the land in previous years is unknown



Based on just alphanumeric data it is impossible to ascertain if a parcel declared in 2012 actually is permanent pasture

## Permanent grassland on a yearly basis

Onderdeel	2007	2008	2009	2010	2011	2012	2013	2014
265 Blijvend grasland	789.271	776.890	746.958	756.723	760.320	743.889	712.635	705.152
3718 Natuurlijk grasland						48.871	48.314	55.230
1905 Natuurlijk grasland	26.013	36.793						
2301 Natuurlijk grasland			15.143	15.421	18.344			
2302 Natuurlijk grasland			28.220	32.057	33.209			
Subtotaal (a)	815.284	813.683	790.321	804.201	811.873	792.760	760.949	760.382
Totaal landbouwgrond	1.952.018	1.910.449	1.901.480	1.893.144	1.883.325	1.875.506	1.862.827	1.875.308
3722 Overige natuurterreinen						14.778	15.458	17.073
1936 Bos met herplantplicht	6.369	6.143	12.198	9.380	8.501	8.093	7.858	6.908
866 Overige natuurterreinen	35.575	27.316						
2303 Heide begraasd				17.610	15.079			
2304 Overige natuurterreinen				10.674	11.788			
Subtotaal (b)	1.910.074	1.876.990	1.889.282	1.855.480	1.847.957	1.852.635	1.839.511	1.851.327
Aandeel blijvend grasland	42,68%	43,35%	41,83%	43,34%	43,93%	42,79%	41,37%	41,07%
CBS Areal landbouwgrond	1.914.250	1.929.220	1.917.410	1.872.320	1.858.390	1.841.700	1.847.570	1.837.930
CBS Areal blijvend grasland	794.300	791.560	784.820	768.750	766.390	746.170	722.090	704.710
CBS Aandeel blijvend grasland	41,5%	41,0%	41,8%	41,1%	41,2%	40,5%	39,1%	38,3%

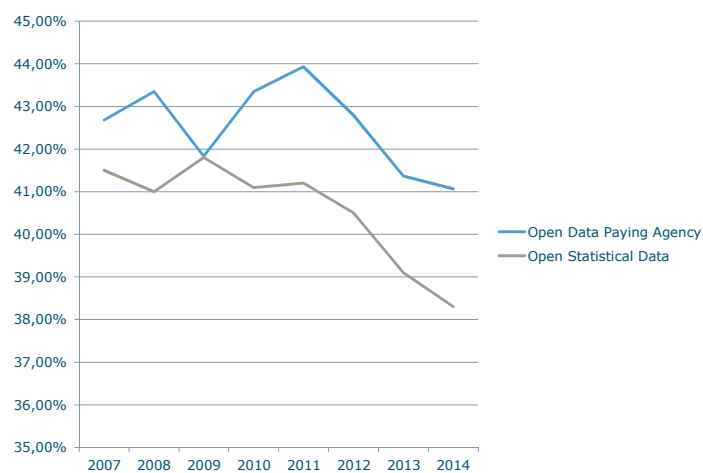
In 2011 **766.390 ha** permanent pasture

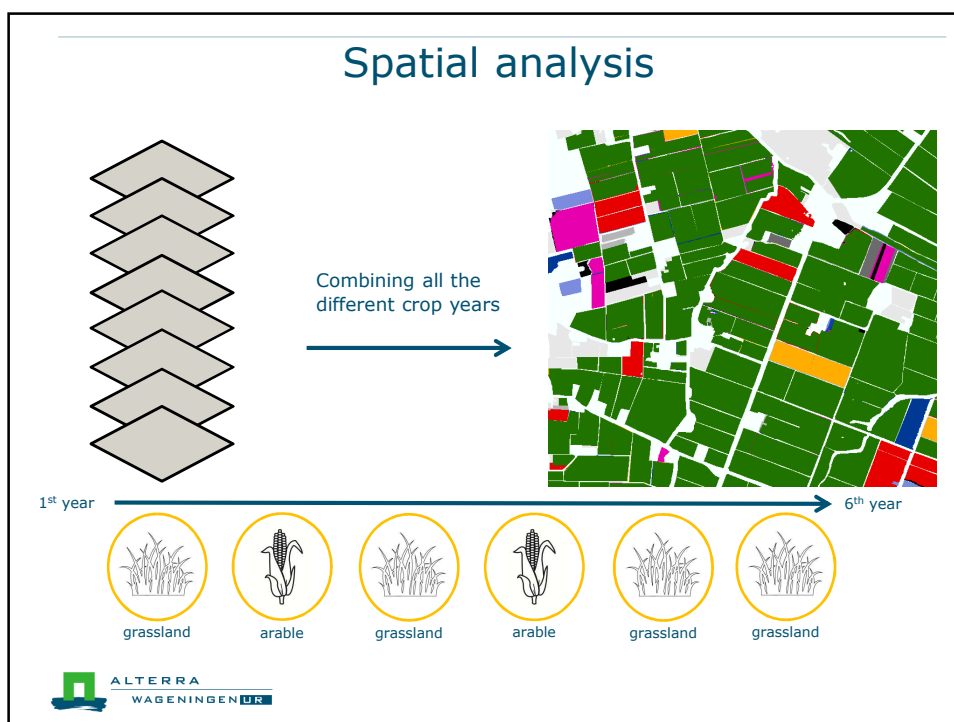
Are we talking about the same parcels???

In 2012 **746.170 ha** permanent pasture



## Permanent Pasture Chart



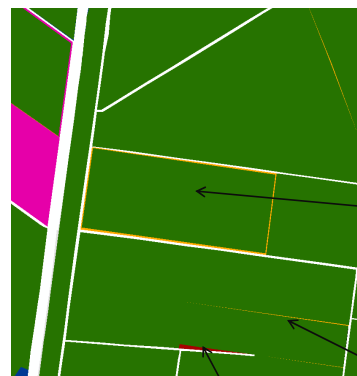


## General rules

- Farmers declaration is correct unless there are indications that he made an error
- After 5 years declaring land as grassland it is considered permanent pasture in the 6<sup>th</sup> year (including temporary grassland)
- If a year is missing and in 2012 it is declared as permanent grassland, and there are no indications that the land was used for something else in the previous five years, than the land is considered as permanent grassland



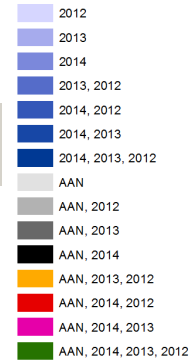
## Many small differences



In 2013 a small corner disappeared

### Legend

brp141312\_u\_aan\_sp  
overzicht

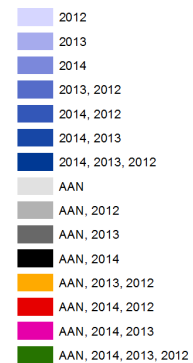


## Many small differences



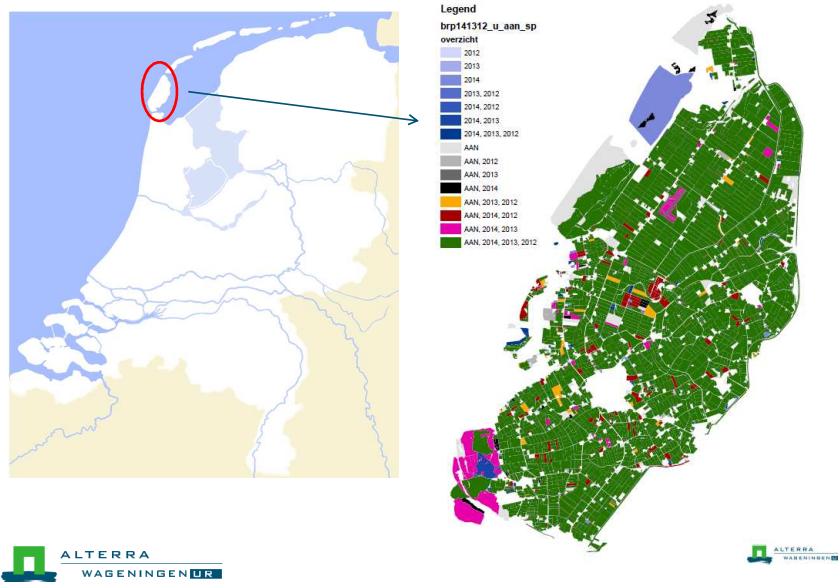
### Legend

brp141312\_u\_aan\_sp  
overzicht



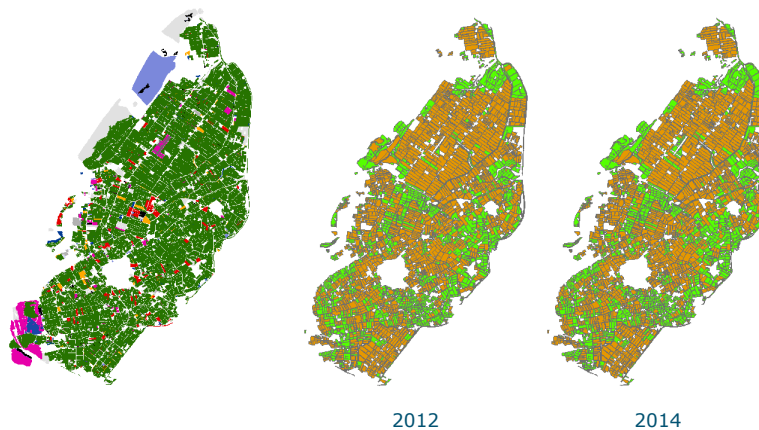


## Many small differences - Texel

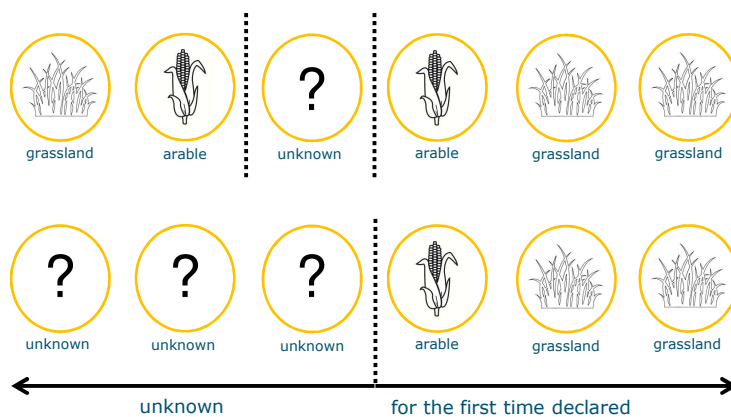


## Many small differences

- General solution is allocating small differences/slivers to the biggest neighbouring parcel (within the reference block)



## Missing years



## Missing years – the numbers

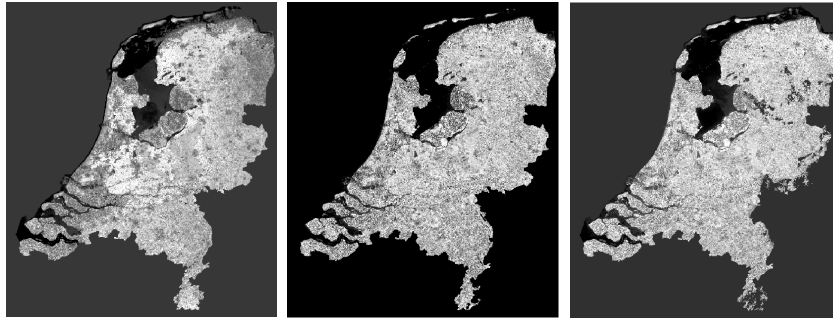
Gewasgroep	2007	2008	2009	2010	2011	2012	2013
Permanent grassland	10212	2650	6984	1856	1445	1471	2184
Natural grassland	1163	381	703	266	337	487	520
Temporary grassland	1378	494	636	367	308	777	1252
<b>totaal</b>	12753	3525	8323	2489	2090	2735	3956



1 year missing → 35.871 ha  
several years missing → 58.576 ha

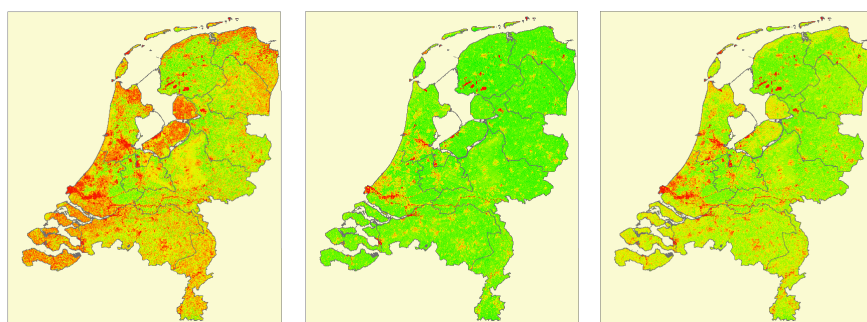
## Missing years (rasterdata)

### ■ Satellite and areal imagery



Imagery available from 2009, 2010, 2011, 2012, 2013 and 2014

## Missing years (biomass)

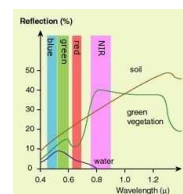


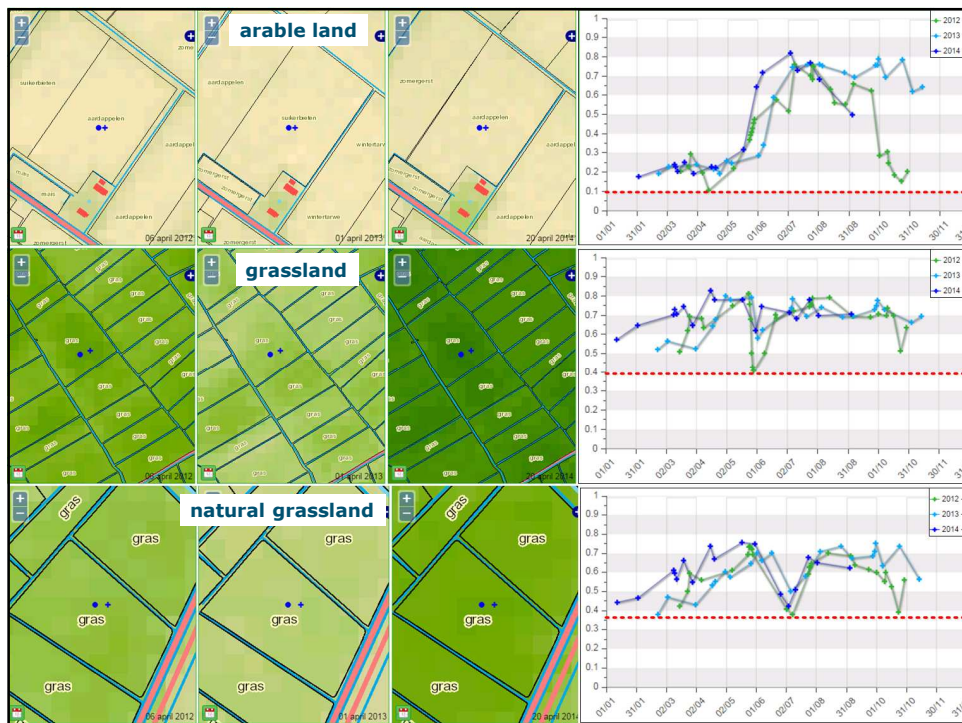
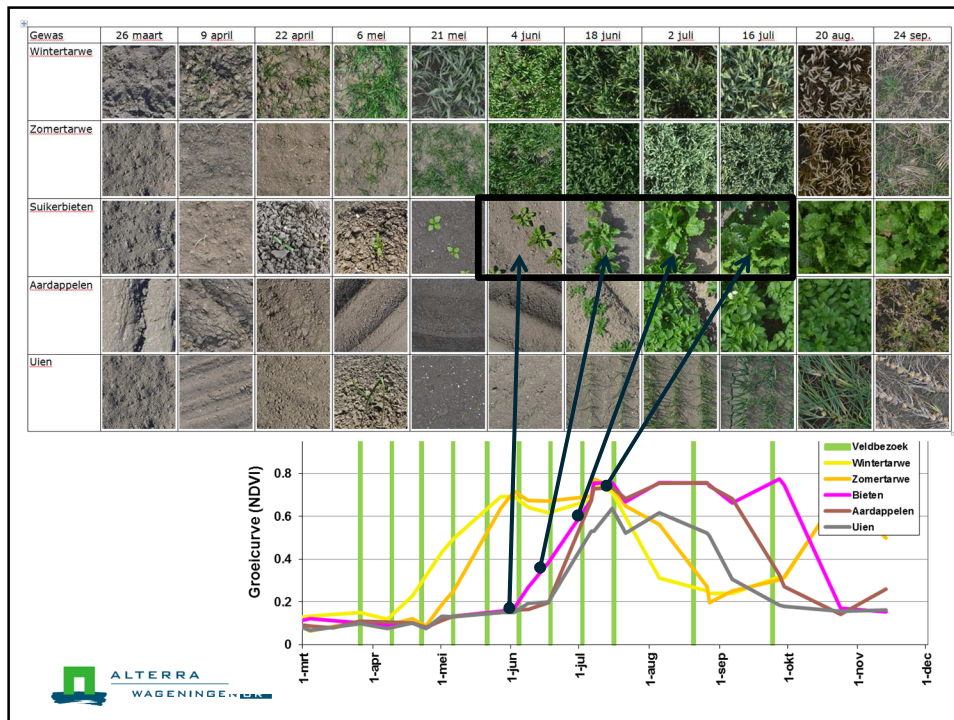
minimal value

maximum value

average value

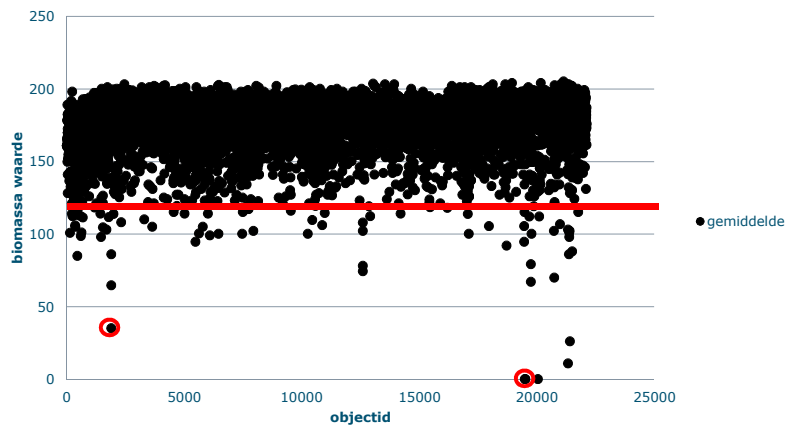
Normalised Difference Vegetation Index  
 Typical NDVI values:  
 Water:  $< 0$   
 Bare soil:  $0.1 \sim 0.2$   
 Vegetation:  $0.2 \sim 0.8$





## Checking missing years

### Average biomass value for missing parcels in 2010



## General results analysis missing years



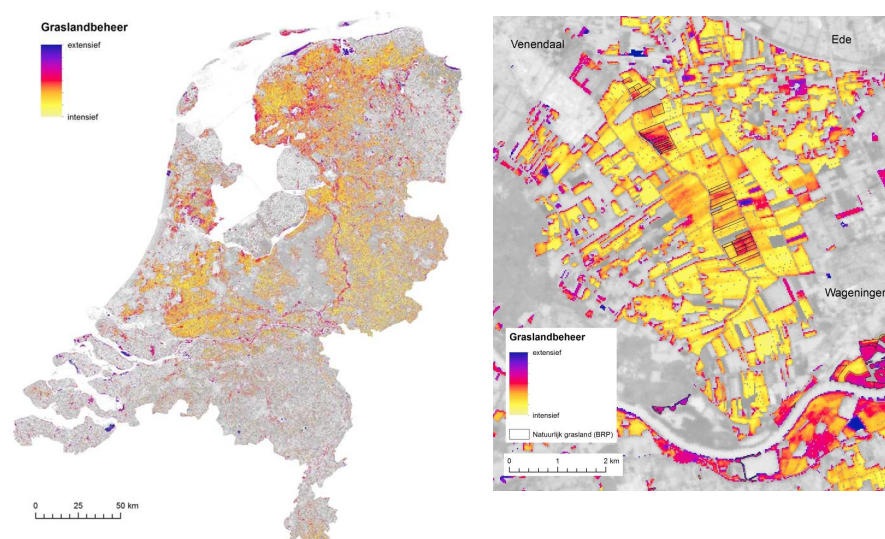
- Conclusion:
- Grassland
  - Low values are edges and nature



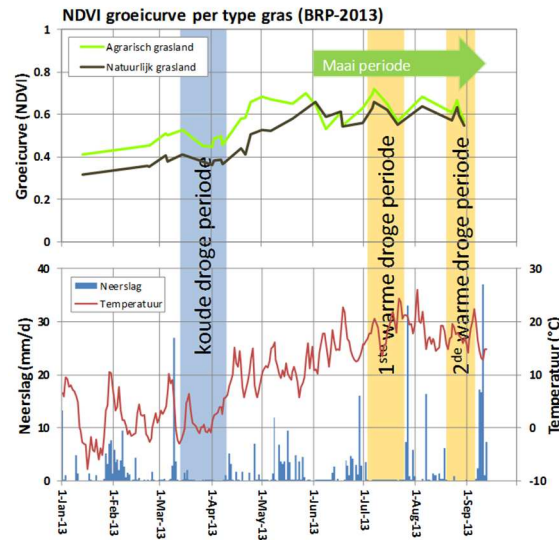
## Interesting findings

- Temporary pasture in some cases permanent grassland
- Permanent pasture in some cases isn't permanent grassland based on the history

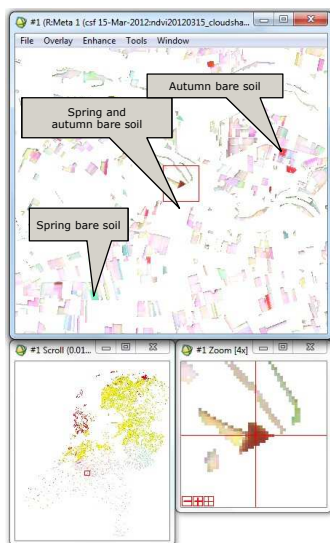
## Intensive vs extensive use



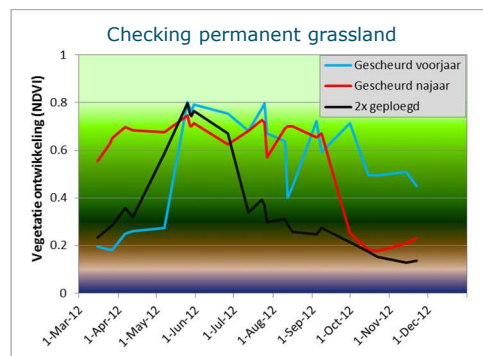
## Monitoring grassland management



## Monitoring other activities



- Red = 15th of March
- Green = 30th of September
- Blue = 14th of November



## Monitoring natura2000 areas



Permanent grassland in  
Natura2000 areas



## In conclusion

- It is possible to measure activities on grassland
- It is possible to measure crop cover / catch crops





## Questions



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