High Resolution Phenology

Wageningen Environmental Research (WENR)
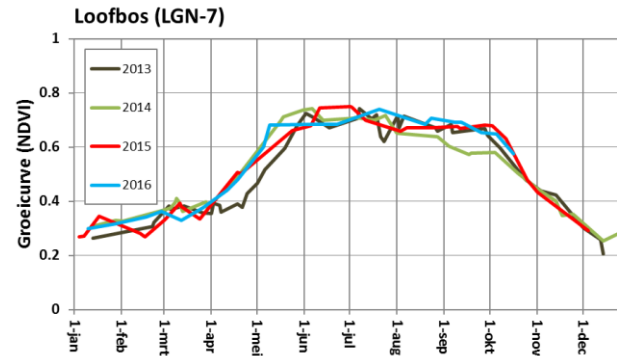
13 Juni 2018, Gerbert Roerink

Contents

- High Resolution Phenology (HRP)

- Dutch Greenmonitor

- New applications and outlook

- Copernicus outlook

High Resolution Phenology

- Phenology

  - Biological perspective: periodic plant and animal behaviours

  - Remote sensing perspective: time series analysis

High Resolution Phenology product

- Remote sensing phenology needs dense time series of satellite images

- So far only medium resolution (>250 m) phenology products exist (NOAA-AVHRR, MODIS, MERIS)

- Times series algorithms: Timesat, HANTS, B-FAST, ...

- Regional patterns
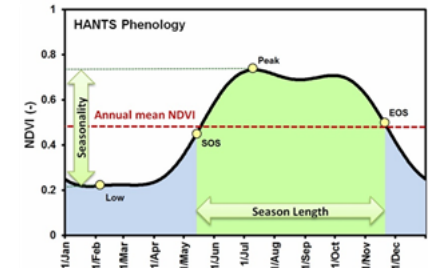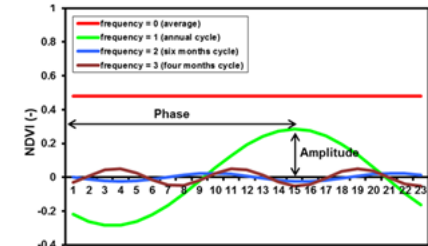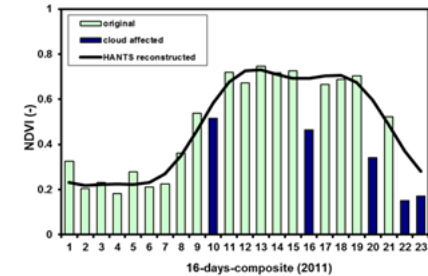
High Resolution Phenology product

Level	Product	Description
1	Processed satellites images	Time series of VI images. Cloud/shadow free and atmospherically corrected
2	Standard phenology indicators	Start, End, Min, Max of season Season amplitude and length Min, Max, Mean greenness Productivity
3	Derived specific applications	Crop harvest, closure, start Tree greening No of mowing events

High Resolution Phenology product

- Medium resolution phenology (MODIS, HANTS)
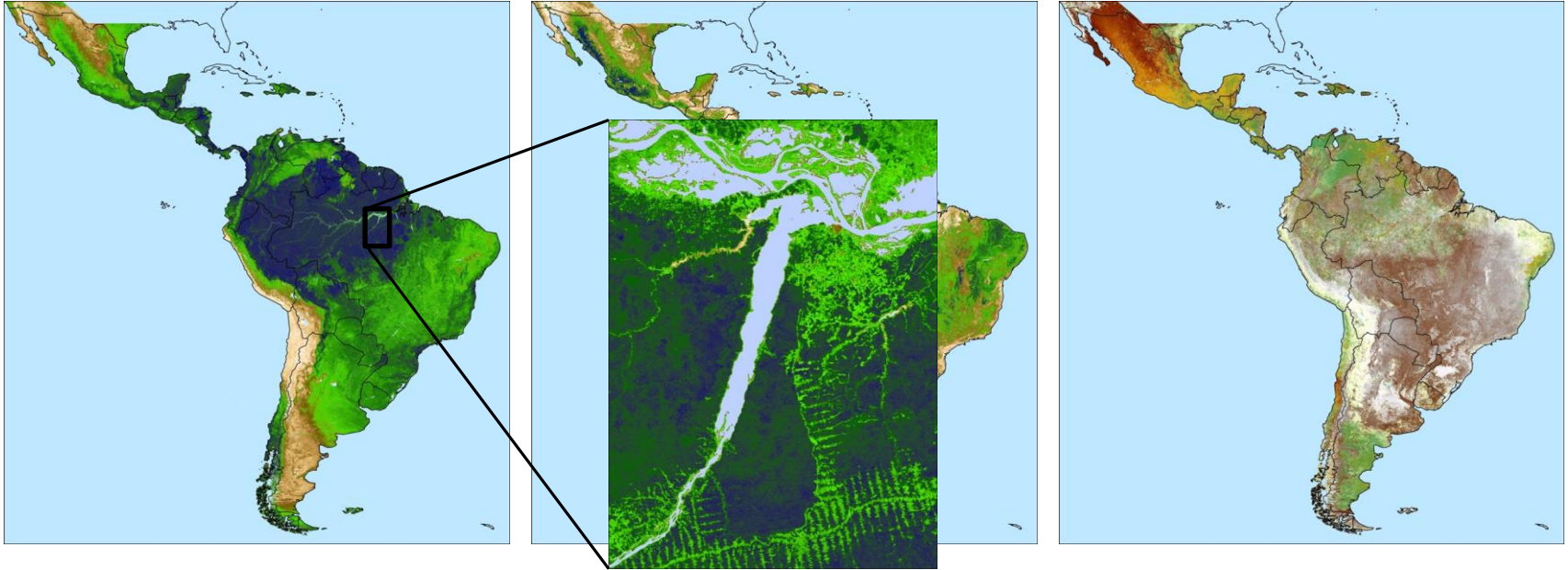
High Resolution Phenology product

- Medium ➔ high resolution

- Regional ➔ field level

- Game changer!!

High Resolution Phenology product

- **New applications**

Agriculture	Other
Grassland - Intensity - Mowing events - productivity	Forestry - Deforestation at tree level - Tree type mapping - Diseases
Cropland - Productivity/yield - No of growing seasons - Start/end of season - Green fertilizer applications	Water management - Flooding - Water logging - Wetland dynamics
Precision agriculture - Intra-field patterns and temporal changes	Urban - Greenness (urban heat island effect)

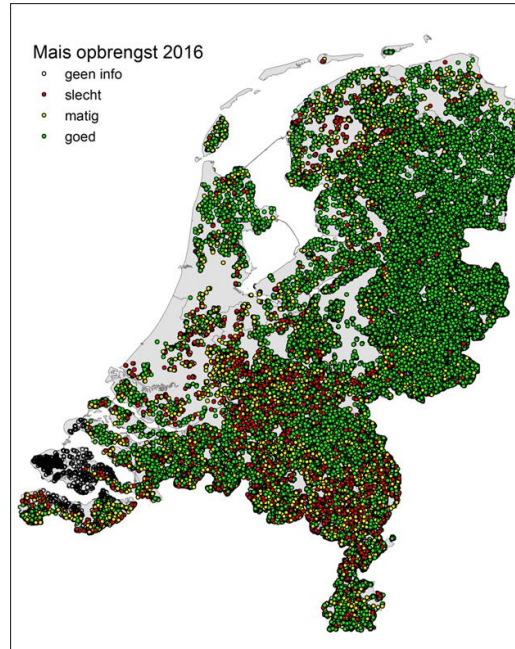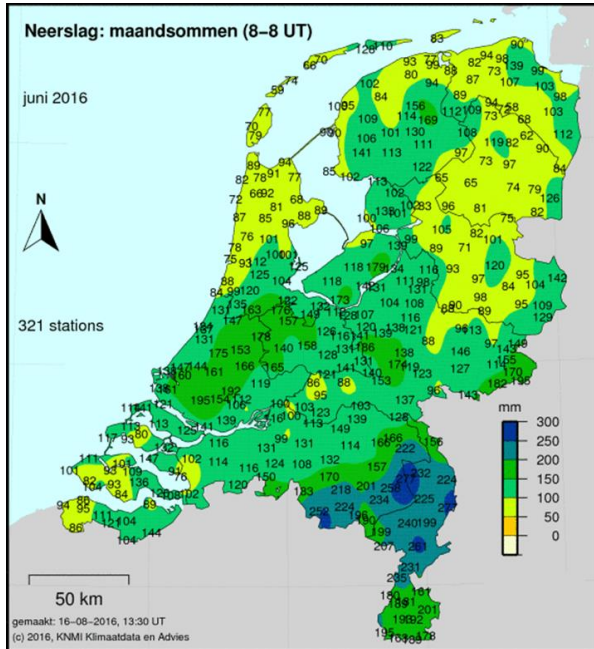- **Agriculture: new tools to help but also to control farmers**
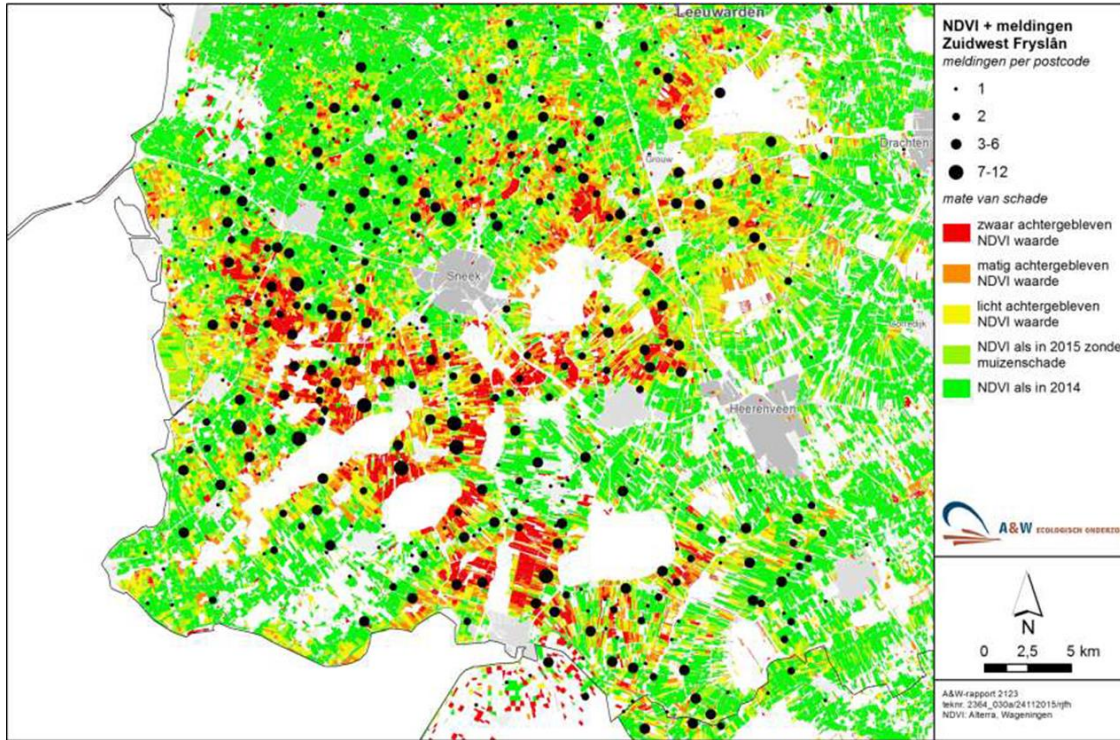
www.groenmonitor.nl
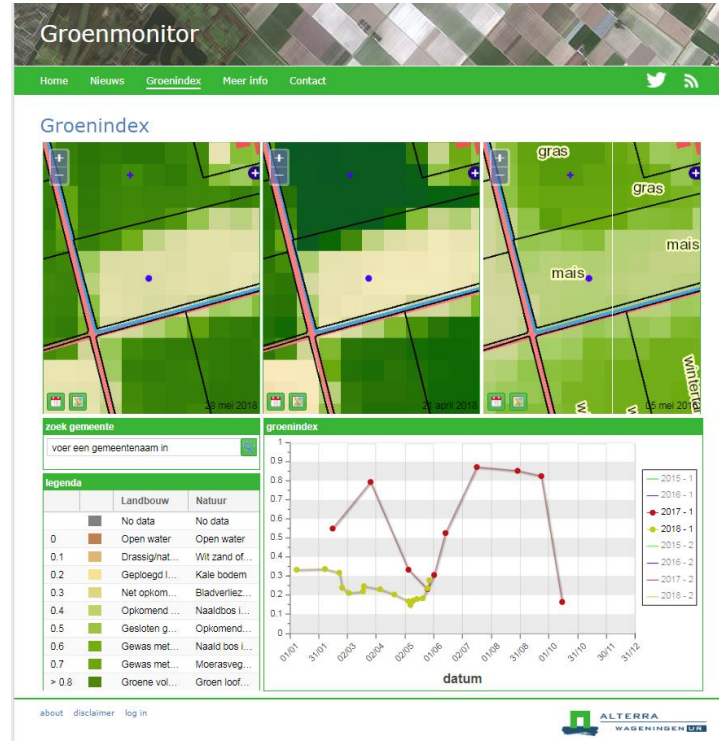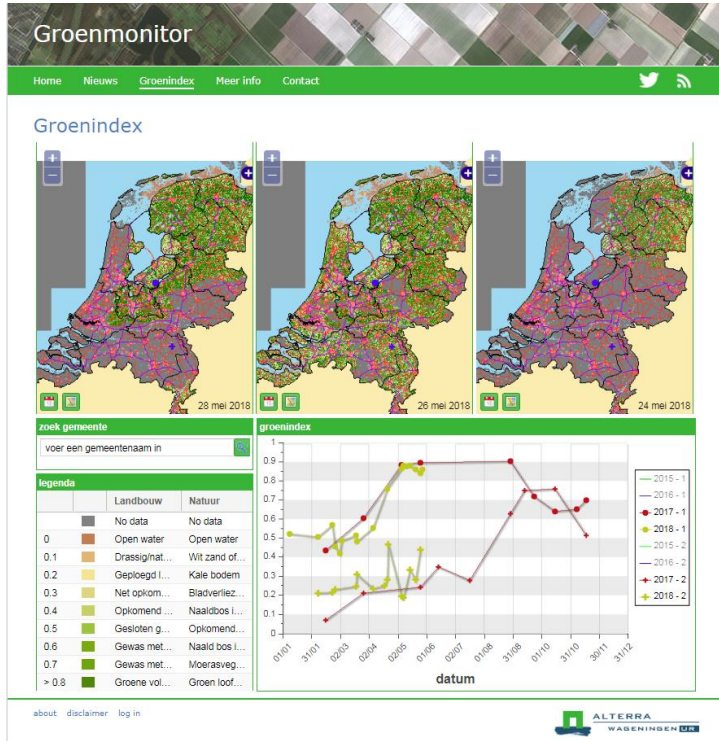
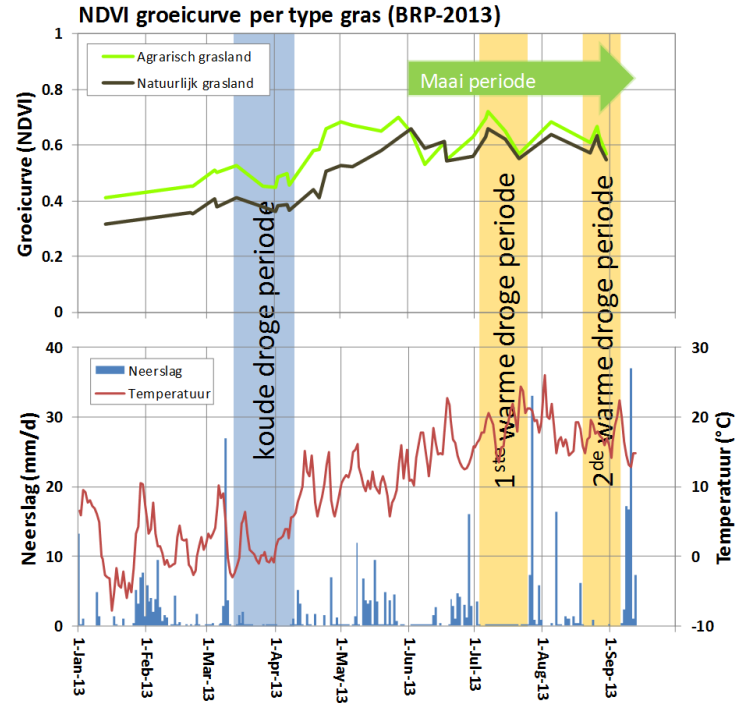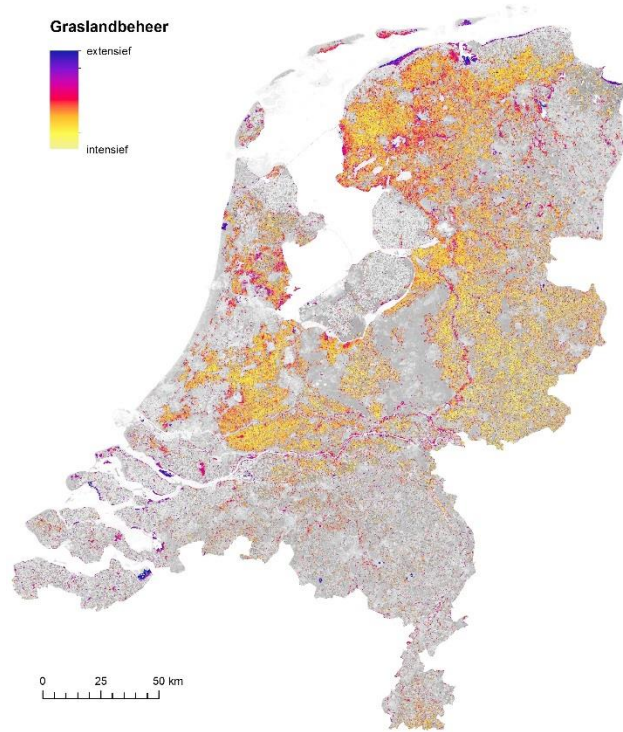# Crop damage – excessive precipitation

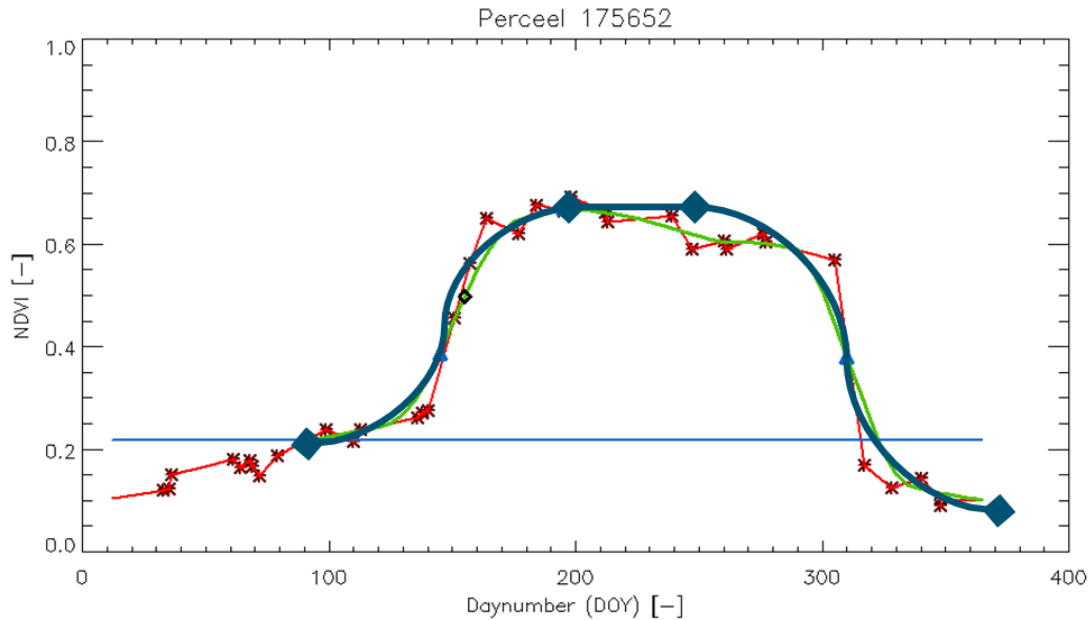# Crop damage – excessive precipitation

Fauna damage

Grassland extensivity

Growing season quantification

Perceel 175652

Copernicus

- Call for proposals is ready but on hold

- Technical challenges

  - Cloud and shadow screening

  - Big data – smart processing solutions

  - Detection of abrupt changes (mowing, harvest, etc)

- Huge task

- Focus on new applications!

- SBIR supports but...

Copernicus

Level	Product	Description
1	Processed satellites images	Time series of VI images. ~~C~~ ESA, NASA, Airbus, Planet, etc. ~~rically~~ corrected
2	Standard phenology indicators	Start, End, Min, Max of season ~~Season amplitude and length~~ VITO, DLR, WUR ~~Min, Max, Mean greenness~~ Productivity
3	Derived specific applications	Crop harvest, closure, start ~~T~~ VA industry No of mowing events

WAGENINGEN
UNIVERSITY & RESEARCH

100 years
1918 — 2018