# SATTELLITE BASED MOWING DETECTION

AHTI  BLEIVE
ARIB
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# BACKGROUND

- Mowing or grazing of grassland by certain date is one of the most common requirements for all area based supports in Estonia.

- Mowing requirement is quite often violated. This is keeping error rate high.

- On the spot checks are done only for 5-6 % of applicants.

- Cost of on the spot checks is rising every year.

- There is a need to reduce number of on the spot checks and to have better targeted field inspections.

- Preventing errors is better than sanctioning.

# PRE-DEVELOPMENTS AND RESEARCH BASIS

- Research and preparatory projects started in 2011.
- Main research and development partner: Tartu Observatory.
- SAR-based projects: 2011, 2013 and 2015, using TerraSAR-X, RADARSAT-2, COSMO SkyMED and Sentinel-1 data.
- Optical data projects: 2012 and 2013, using VHR and HR satellite data from WorldView, QuickBird and Spot.
- *Encouraging satellite based results, well in line with field inspection results!*

# DEVELOPMENT OF MOWING AND GRAZING DETECTION SYSTEM "SATIKAS"

- Country level operational mowing detection service is at the moment in development and testing phase.

- Reporting the mowing detection results ( mowing dates ) to the farmers and paying agency officials.

- Combining Sentinel-1 and Sentinel-2 time series and meteorological data.

- Development years: 2016-2017.

- Full testing 2017 (pilot). Results will be peresented in October at PA's Directors Conference.

- Service fully operational starting from 2018.

# PROJECT TEAM

- Estonian Agricultural Registers and Information board – service user, definition of requirements.
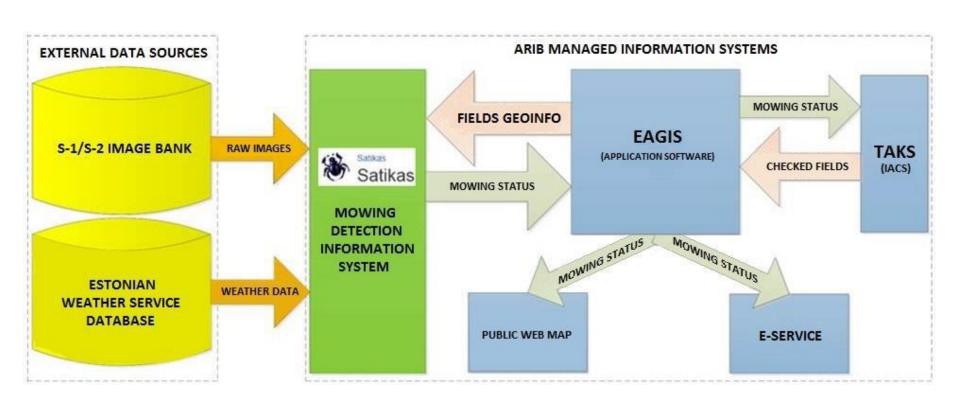


- Tartu Observatory – science partner, mowing detection scientific calculations.



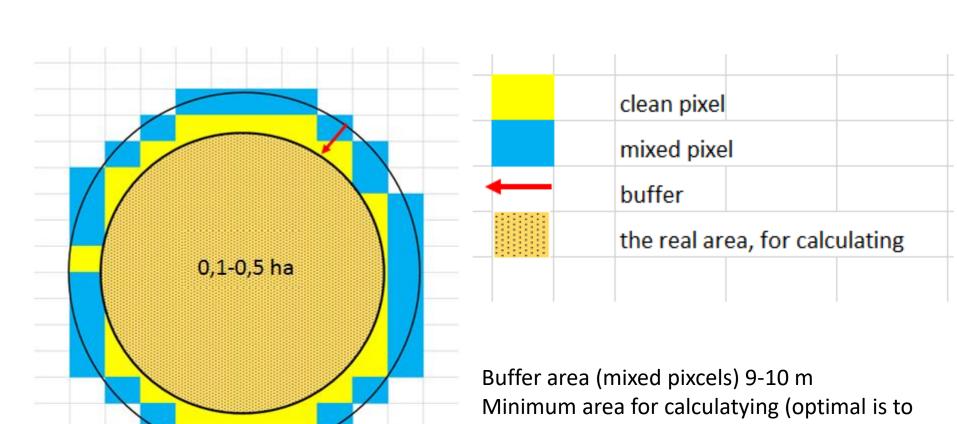- CGI Estonia – software development partner, software development and integration tasks.

# SYSTEM OPERATING PRINCIPLE

# OPERATIONAL SYSTEM

- Field borders from PA GIS database.

- Support application and farmers data from IACS.

- Due to input data resolution (10-30 m) constraints, system covers fields greater than 0.1-1 ha (corresponding to ca 98 % of the grasslands area in Estonia).

- Input data temporal density: new image every 2 days.

- Update of "mowing layer" at least every week

- Weather independence thanks to Sentinel-1 radar data.

# MINIMUM SIZE OF THE SURFACE?

clean pixel

mixed pixel

buffer

the real area, for calculating

0,1-0,5 ha

Buffer area (mixed pixcels) 9-10 m
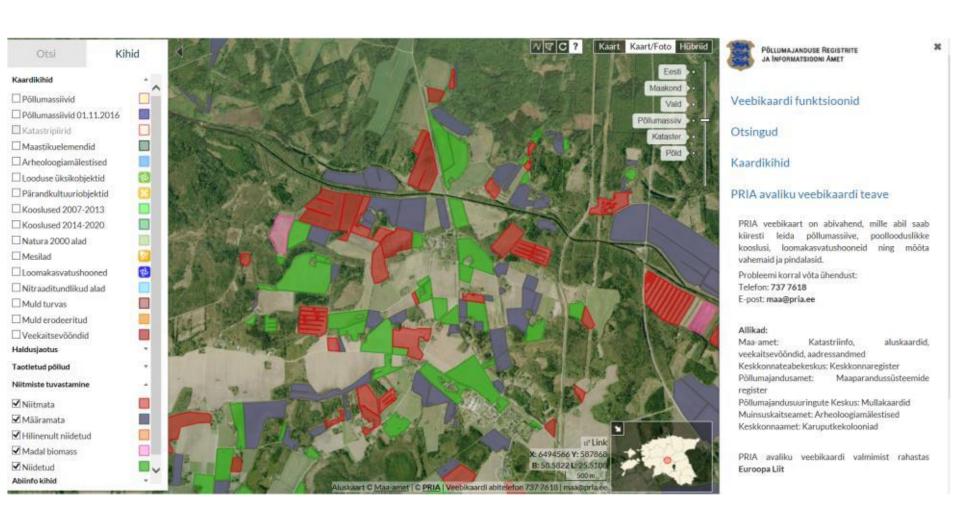Minimum area for calculatying (optimal is to set minimum 0,1-0,5ha)
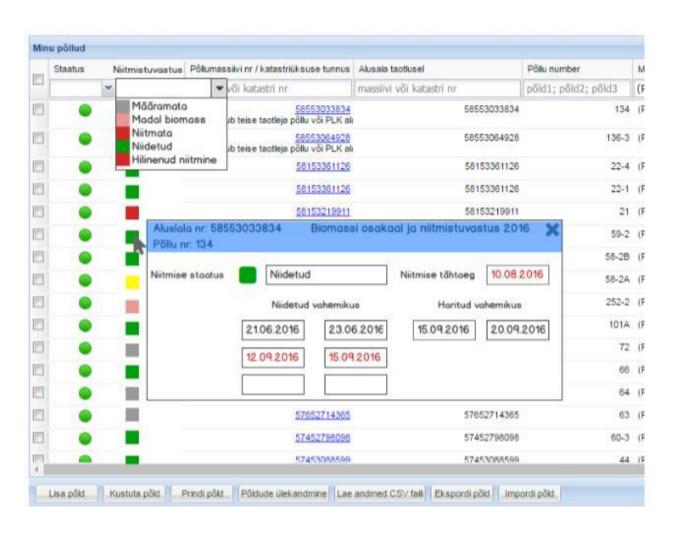
# REMINDERS TO THE FARMER

- The system will notify the farmer when they have two weeks until deadline of mowing.

- Reminders are sent via e-mail or text message.

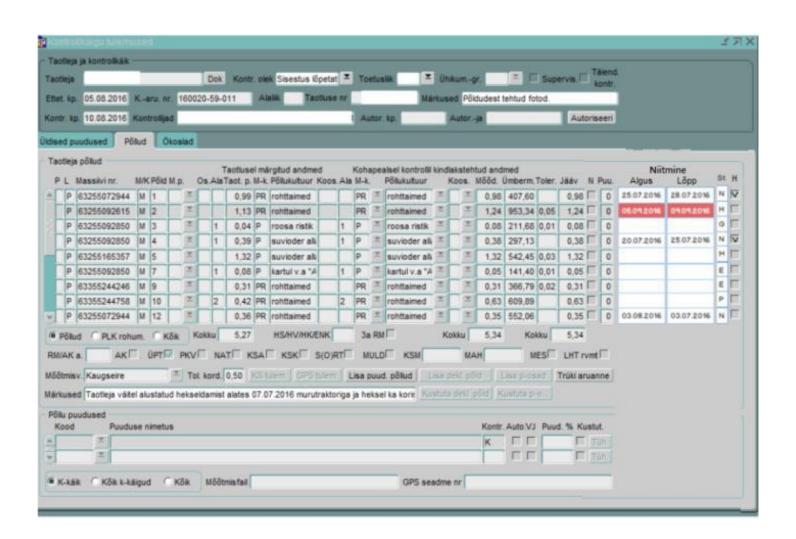- Reminder includes reference

  link to the web map.

# RESULTS ON WEB MAP

# RESULTS IN FARMERS PORTAL

# RESULTS IN IACS SYSTEM

# NEXT STEPS

- Crop (crop group) detection functionality will be added to SATIKAS during 2018.

- Cooperation and exchange of information with external parties – Azercosmos, Planet, ESA, ohter PA's, Learning Network etc.

- Other possible functionalities (and other possible image providers) will be assessed during 2017:

1. Detection of nitrogen fixing crops

2. Detection of cultivation of fallow land

3. Hints for changes in LPIS.

# NEXT STEPS 2

- New initiatives from behalf of European Space Agency and European Commission (JRC). We are very interested to participate in pilots.

- Results from EU Paying Agency Directors conference. Proposal to replace IACS with IAPS (integrated administration and prevention system).

- We have to look wider than just remote sensing and sentinel data to have new innovative error prevention and control methods.

A reasonable person does not exceed the
speed limit when they know that they
are always being monitored.
SATIKAS will work following the same
principle!

Thank you!

Questions?

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