



Mikä data – hanke

Mikä data -project

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TAMPERE
UNIVERSITY OF
TECHNOLOGY



SAMPO ROSENLEW



The European Agricultural Fund
for Rural Development:
Europe investing in rural areas

MIKÄ DATA-project

The project will develop an intelligent data analysis service that will highlight:

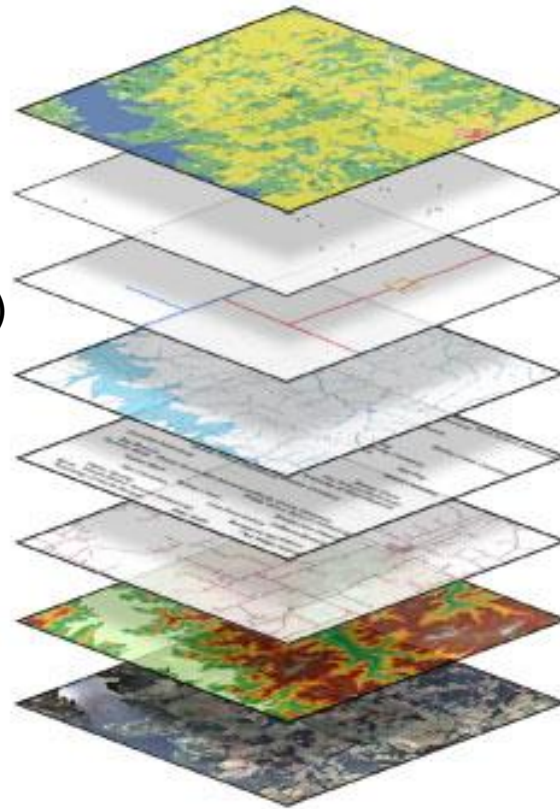
- Variations in soil types
- Nutrient levels (e.g. potassium and phosphorus)

Project schedule 2017/2-2019/12 (3years)

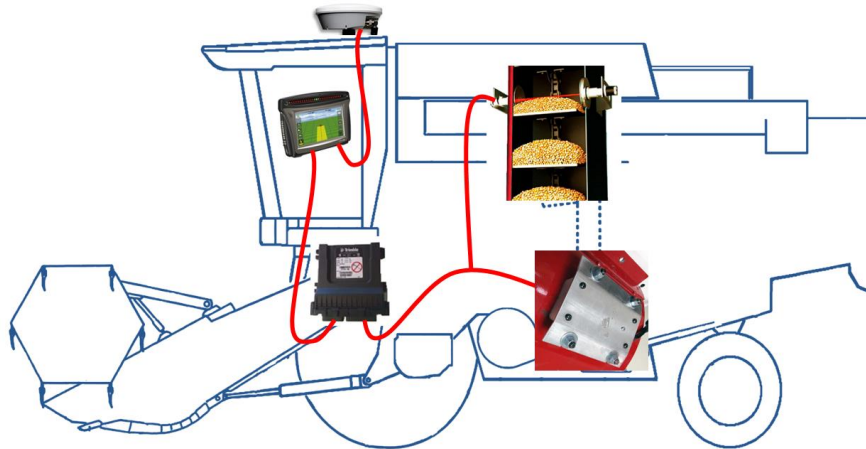


Collected Data in MIKÄ DATA -project

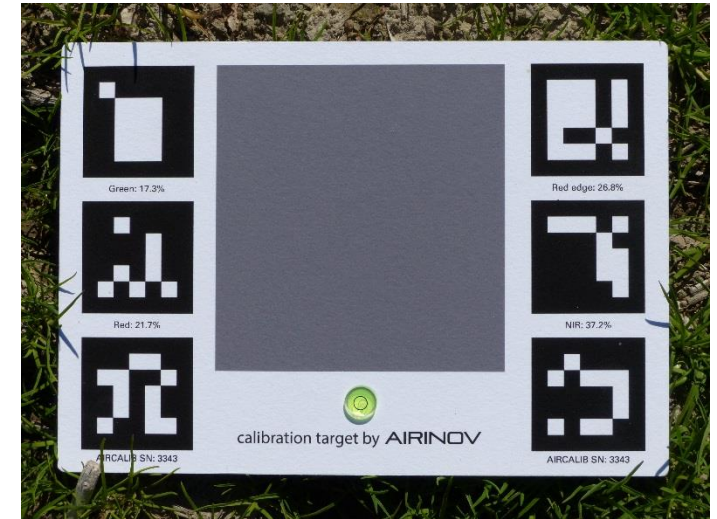
Satellite
Weather
Aerial pictures
Drones (time series)
Yield sensor
Soil samples (grid)
Drain system
Isaria
Lidar



Examples of data sources



Drone flights with multispectral camera



Specs

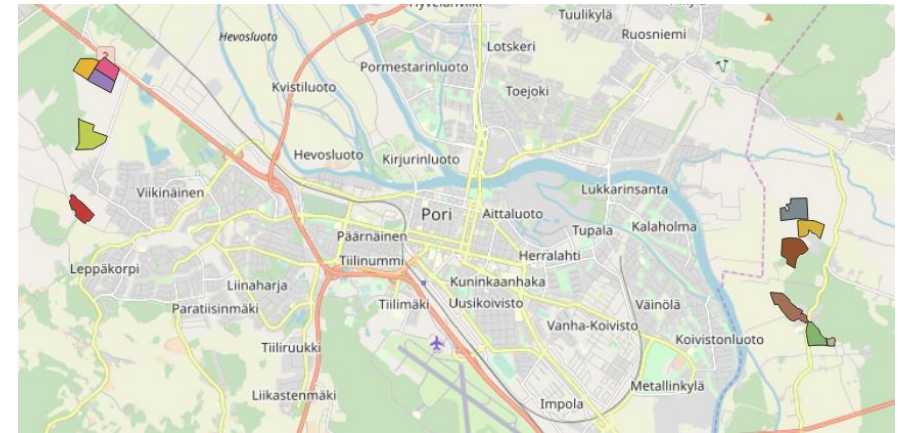


- Drone: Airinov solo 3DR
- Camera: Parrot SEQUOIA sensor
 - 5 spectral bands (red, green, red edge, near infrared and RGB)



Summer 2018

- Flight planning with mission planner program
- 100 ha, 10 fields,
- Drone flights every week
- Drone-mapping with Pix4D



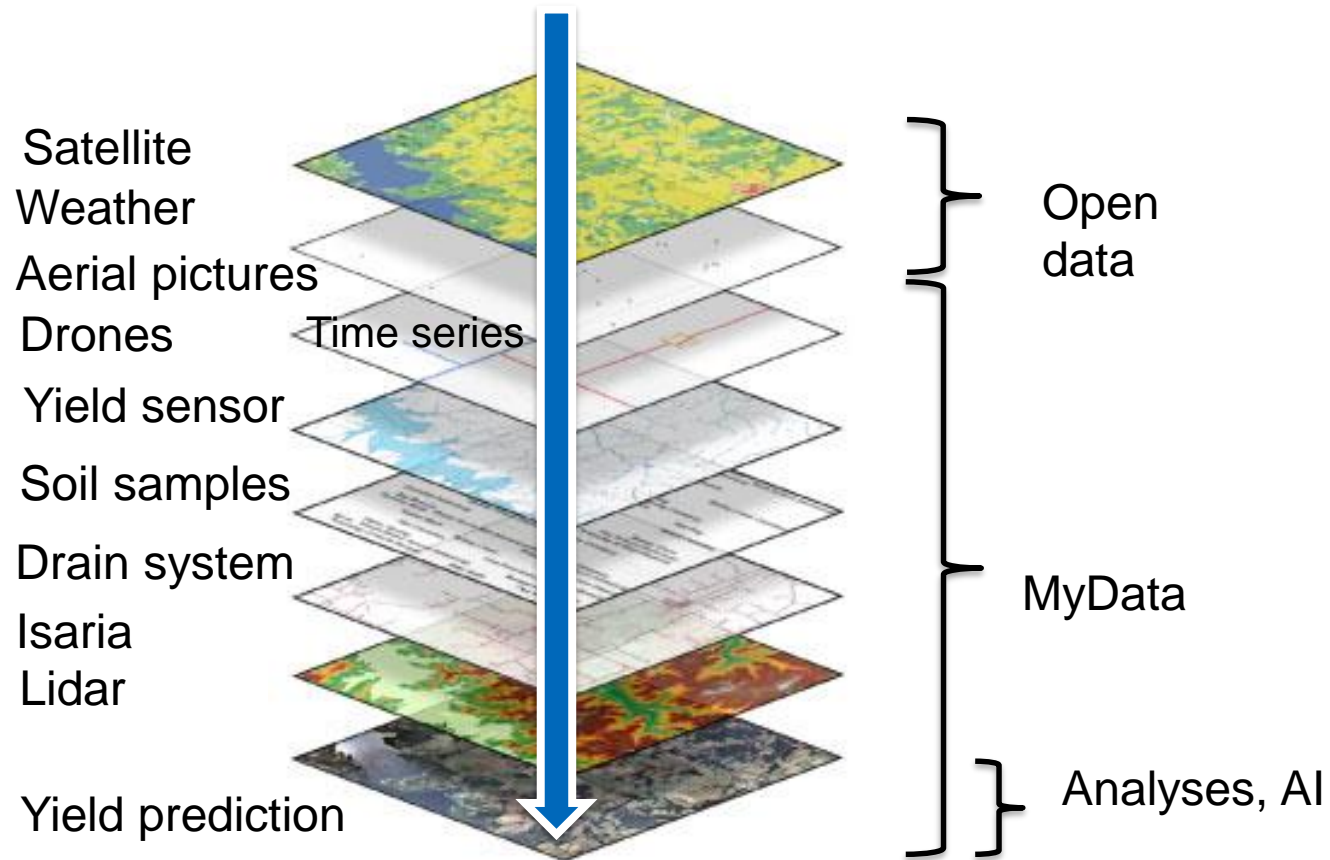
Summer 2019

Parrot Disco Pro Ag

<https://www.parrot.com/eu/business-solutions/parrot-disco-pro-ag>



Open data & MyData



How to show data and analyses for farmers?

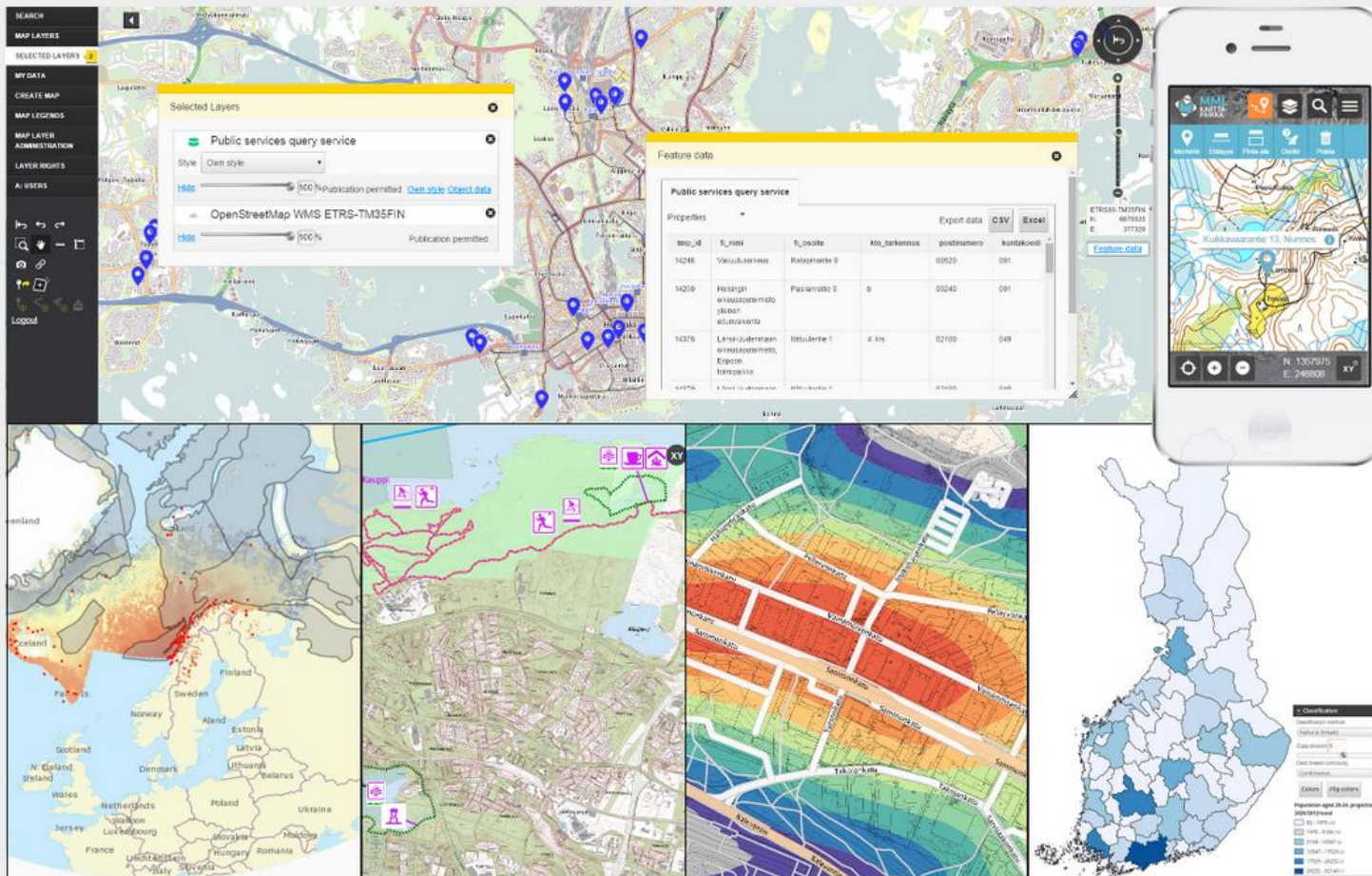


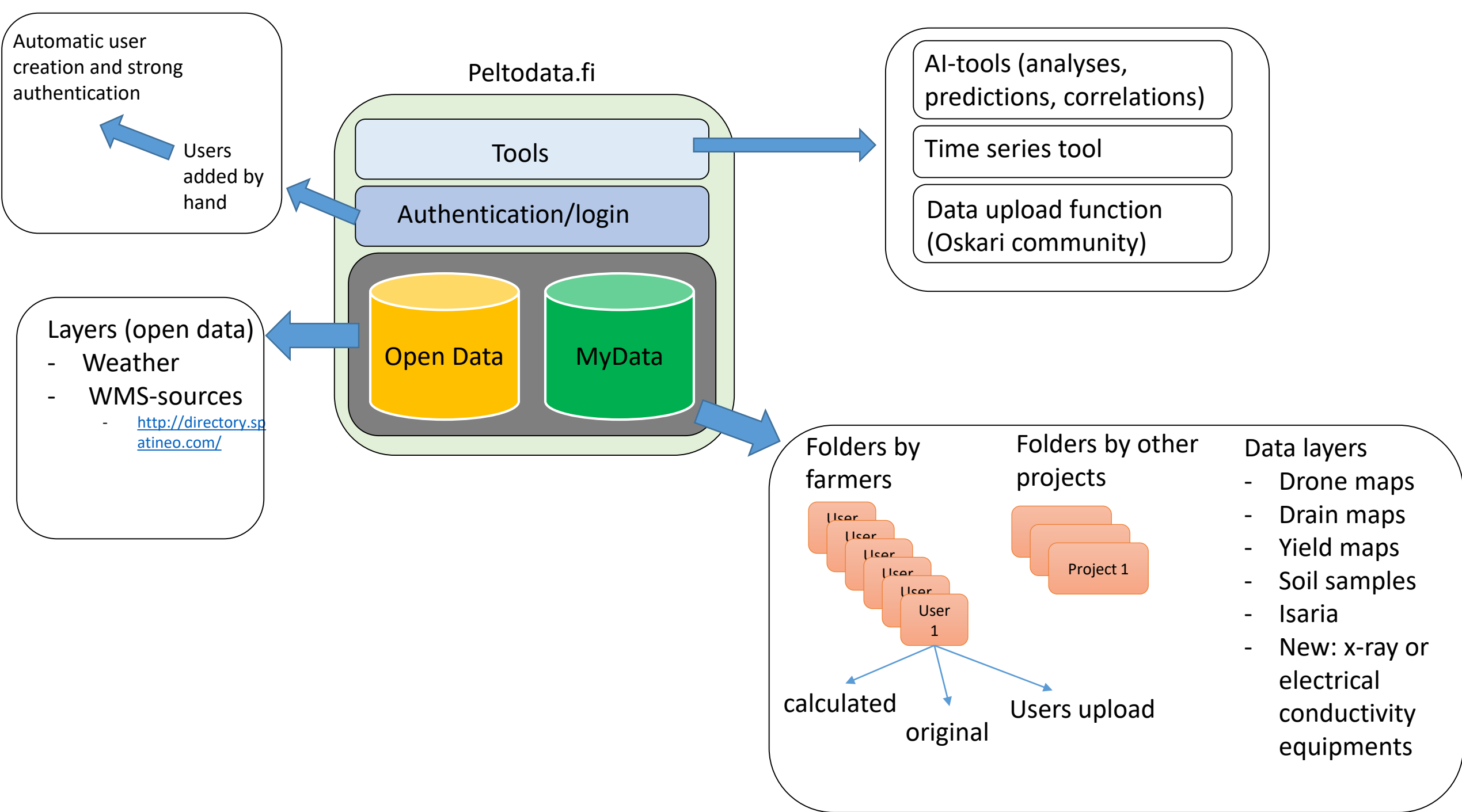
Oskari is a tool for easily building multipurpose web mapping applications utilizing distributed Spatial Data Infrastructures like INSPIRE.

<http://www.oskari.org/>

Examples of implementations

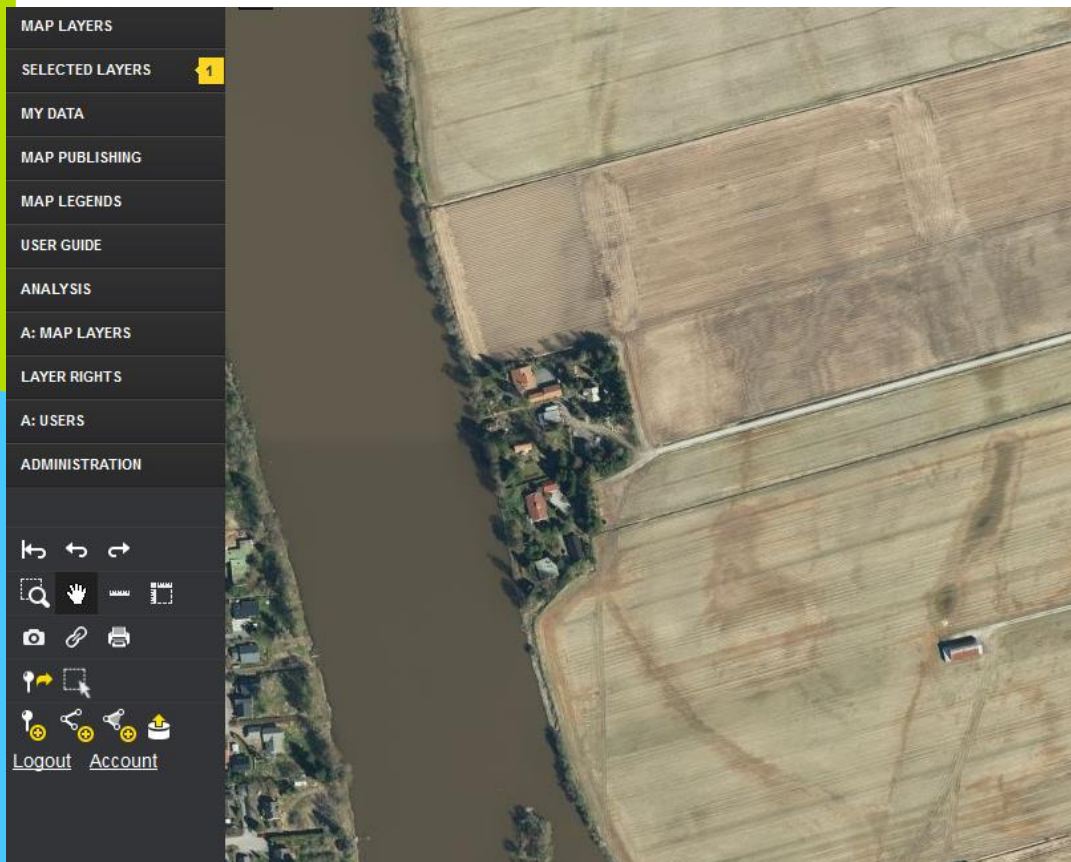
- <https://kartta.paikkatietoikkuna.fi/>
- <https://geoportal.arctic-sdi.org/>





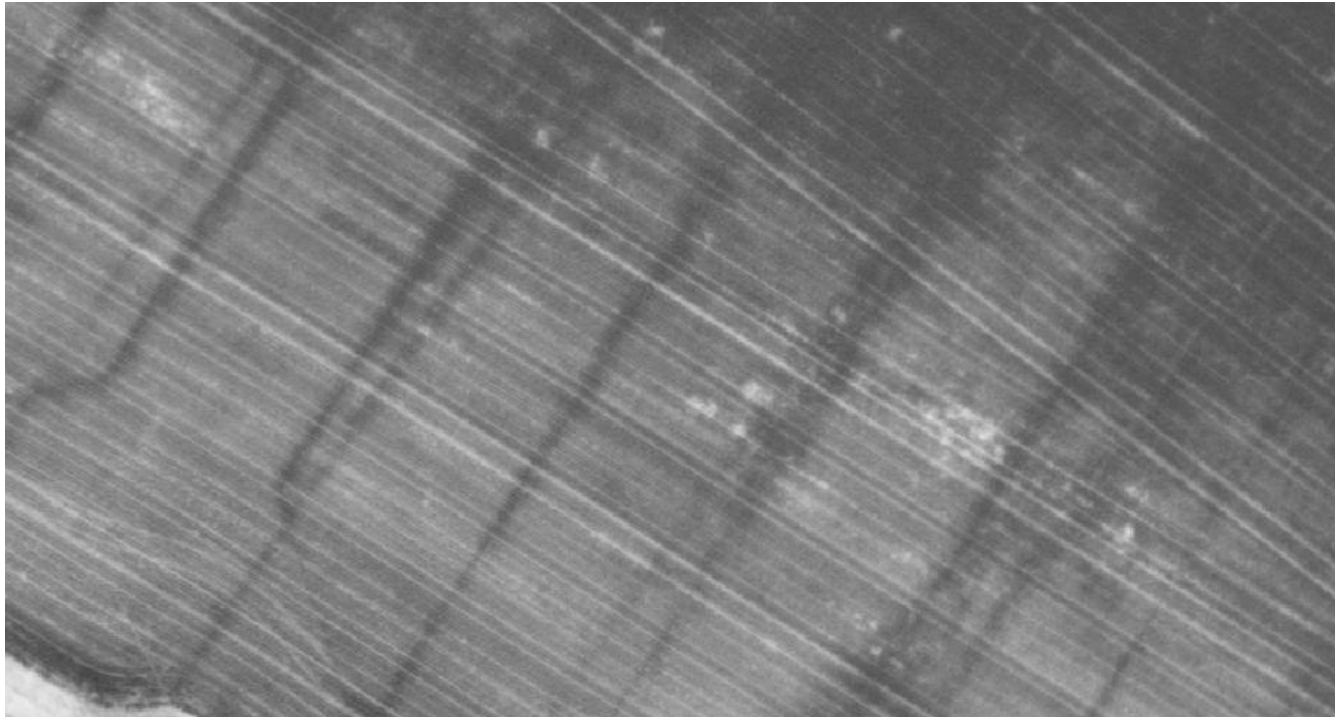
Aerial pictures

Aerial picture 1946



Examples of drone-data

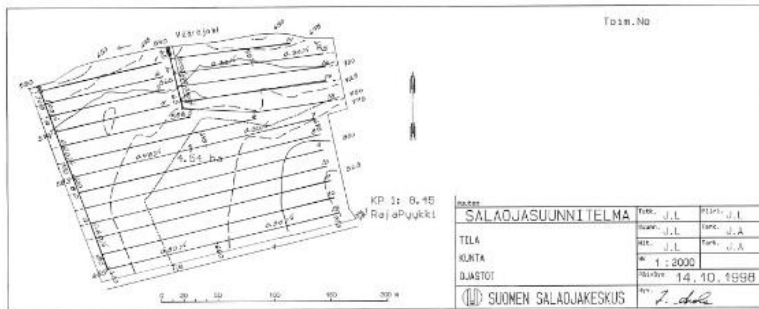
MIKÄ DATA, summer 2018



I846_21_NDVI
I846_21_RGB
I846_22_NDVI
I846_22_RGB
I846_24_NDVI
I846_24_RGB
I846_25_NDVI
I846_25_RGB
I846_26_NDVI
I846_26_RGB
I846_27_NDVI
I846_27_RGB
I846_28_NDVI
I846_28_RGB
I846_29_NDVI
I846_29_RGB
I846_30_NDVI
I846_30_RGB
I846_31_NDVI
I846_31_RGB
I846_32_NDVI

4846_27_NDVI_transparent_reflectance_green.tif
4846_27_NDVI_transparent_reflectance_nir.tif
4846_27_NDVI_transparent_reflectance_red edge.tif
4846_27_NDVI_transparent_reflectance_red.tif

Digitalized and vectorized drain systems maps



Basic informations of areas

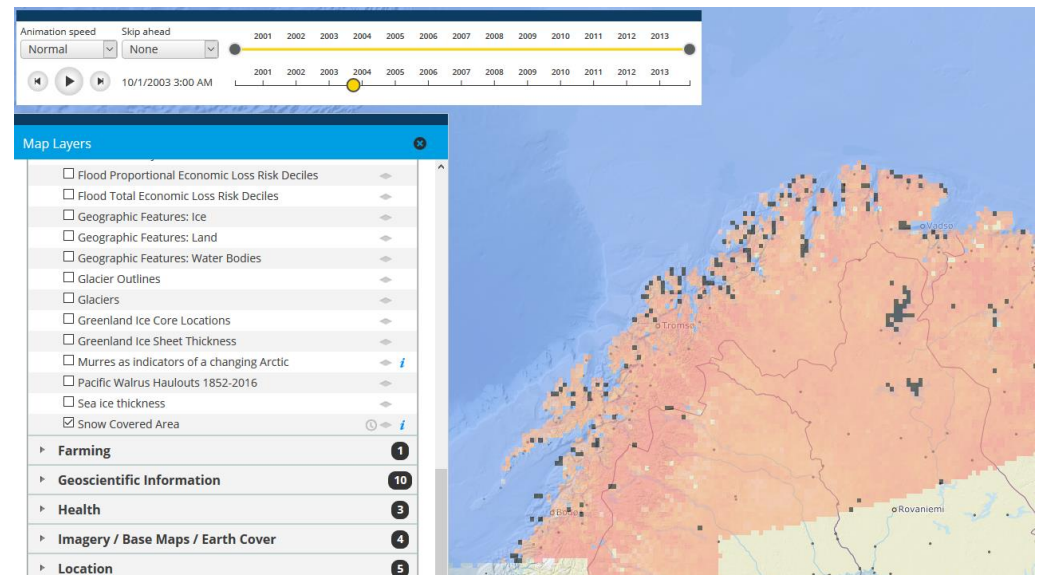
The screenshot displays a GIS web application interface. On the left is a dark sidebar menu with the following items: SEARCH, MAP LAYERS, SELECTED LAYERS (with a yellow notification bubble containing the number '2'), MY DATA, MAP PUBLISHING, MAP LEGENDS, USER GUIDE, ANALYSIS, A: MAP LAYERS, LAYER RIGHTS, A: USERS, and ADMINISTRATION. Below the menu are navigation icons (back, forward, home, search, pan, zoom, print, etc.) and links for 'Logout' and 'Account'. The main area shows an aerial satellite map of a forested area with a building. A 'Feature Data' popup window is open over a specific area, displaying the following data:

peltolohkot_2015			
	peltolohkot_2015		
fid	ELYKNROTILTU	LOHKO	PINTA_ALAYMPARYS
peltolohkot_2015.22978603	609	609061070158.8	320.23

WMS-Time, timeseries-tool

- Next step is add timestamps for pix4d pictures (original drone pictures includes timestamps)

Example of timeseries tool from <https://geoportal.arctic-sdi.org/>

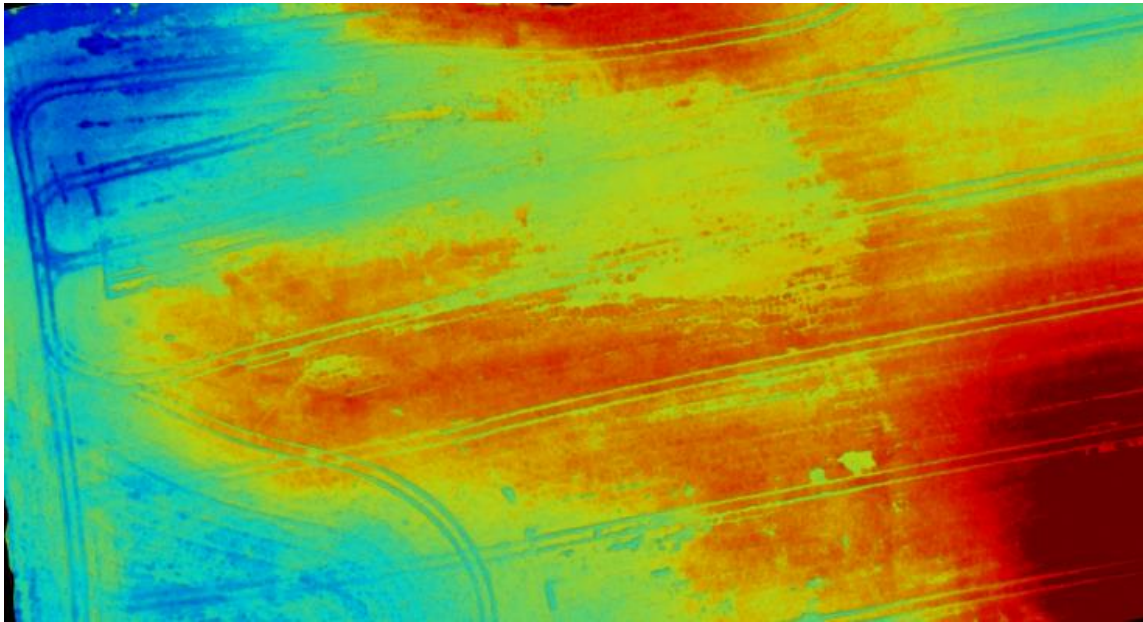


Collaboration with other projects

- University of Turku (drone – data)
- SeAMK (drone-data and maybe other too)

Collaboration model is depending of future plans of peltodata-service. The register description of service is under work.

Seinäjoki University of applied science, SeAMK



University of Turku



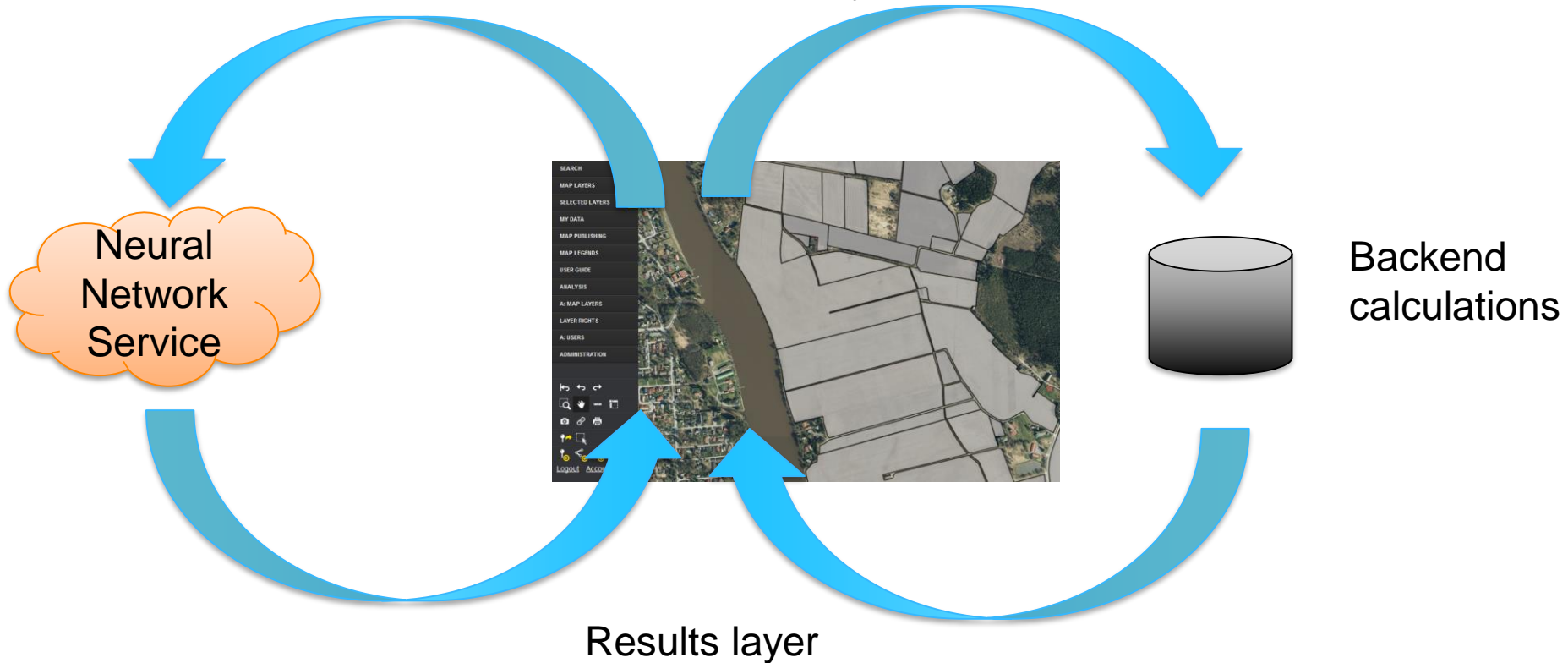
Vulcan Black Widow: RGB-kamera Canon EOS 5D Mark IV + Canon EF 24 mm f/2,8 IS USM DJI Inspire 1: RGB-kamera DJI Zenmuse X5 + DJI MFT 15 mm f/1,7 ASPH sekä multispektrikamera Sentera multispectral double 4K, jossa R, G, B, NIR ja Red edge-kanavat (https://sentera.com/wp-content/uploads/2017/05/SenteraMultispectralDouble4K_Ag_Lit4059A_WEB.pdf)

Basic analyses and AI



Analyses & AI in peltodata?

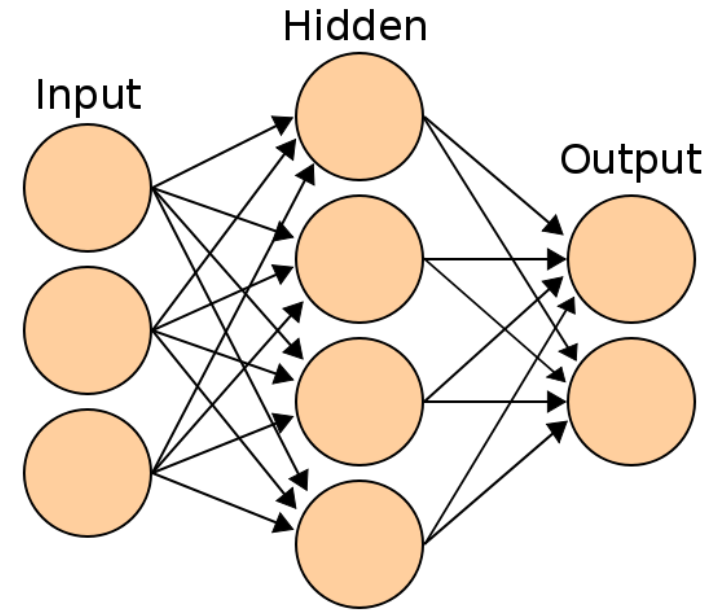
Data from farmer (drone yield sensor)



Timeline of peltodata-service

2018												2019											
3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	7	8	9	10	11	12			
In spring 2018 researched agriculture 150 platforms and under 10 open source solutions																							
			In the summer started to explore Oskari-platform																				
				In the autumn started to build test version of Oskari.																			
							In November began to transfer project's data to service (farmers data of mikä data -project)																
								In December, production server installation will be started.															
								In January will be started to transfer other project's data to service (Turku and SeAMK)															
										Workshop, next steps													
										Steering group meeting, next steps													

AI – Neural networks



- Neural network model
 - based on:
 - satellite, yield sensor and drone data
 - AI tells
 - What data is important
 - Correlations of different data sources
 - Predicts the field yield

Thank you

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