Workshop: Geo-ICT in agriculture – unlocking knowledge capital of the farmers (other sources!!!!!)

24.-25.1.2017 HYDEREABAD, India - GeoAgro 2017

PROGIS INTEGRATED AGRO SOLUTIONS and EC satellite modules SENTINEL II – „A PICTURE ALONE IS TOO LESS“

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Aim

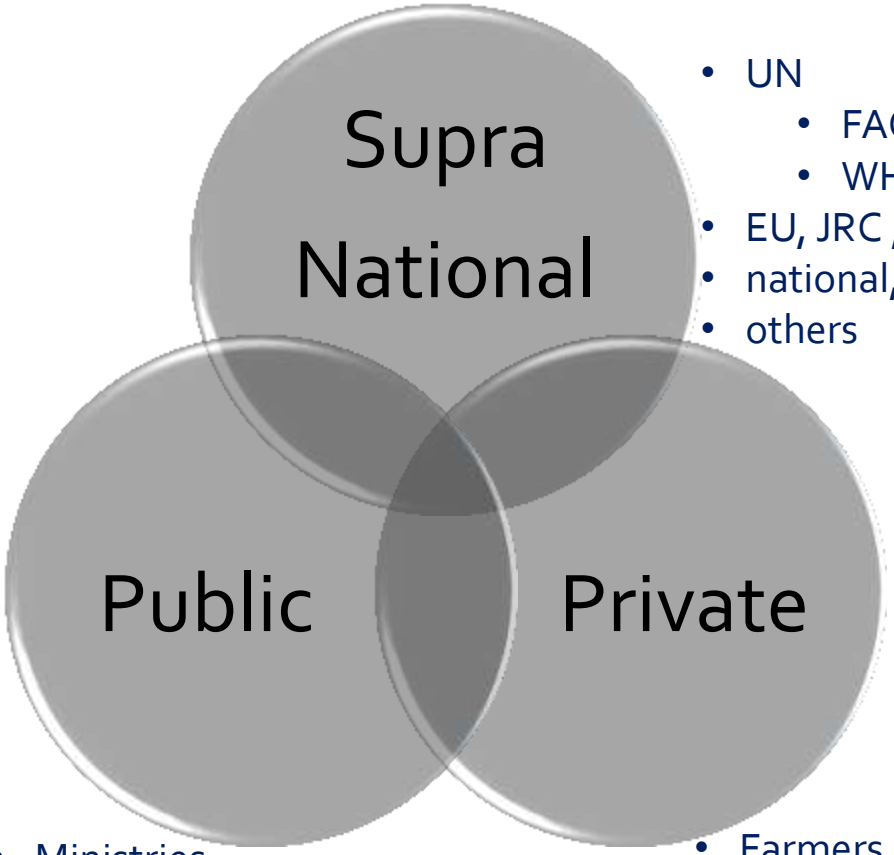
ICT BACKBONE INTERSECTION

for

PUBLIC USERS

PRIVATE USERS

EC - INSPIRE



- UN
  - FAO,WAY, ITU
  - WHO, GFAR
- EU, JRC , AU, ...
- national, regional,....
- others

- Ministries
- Regional and local admin
- Advisory organizations
- Subsidy organizations
- Chambers if av.
- Land consolidation units
- R&D and education

- Farmers, cooperatives
- Agro banks, insurance
- Certification bodies
- Control organizations
- Supply agencies
- Transport sector
- Food – feed industry

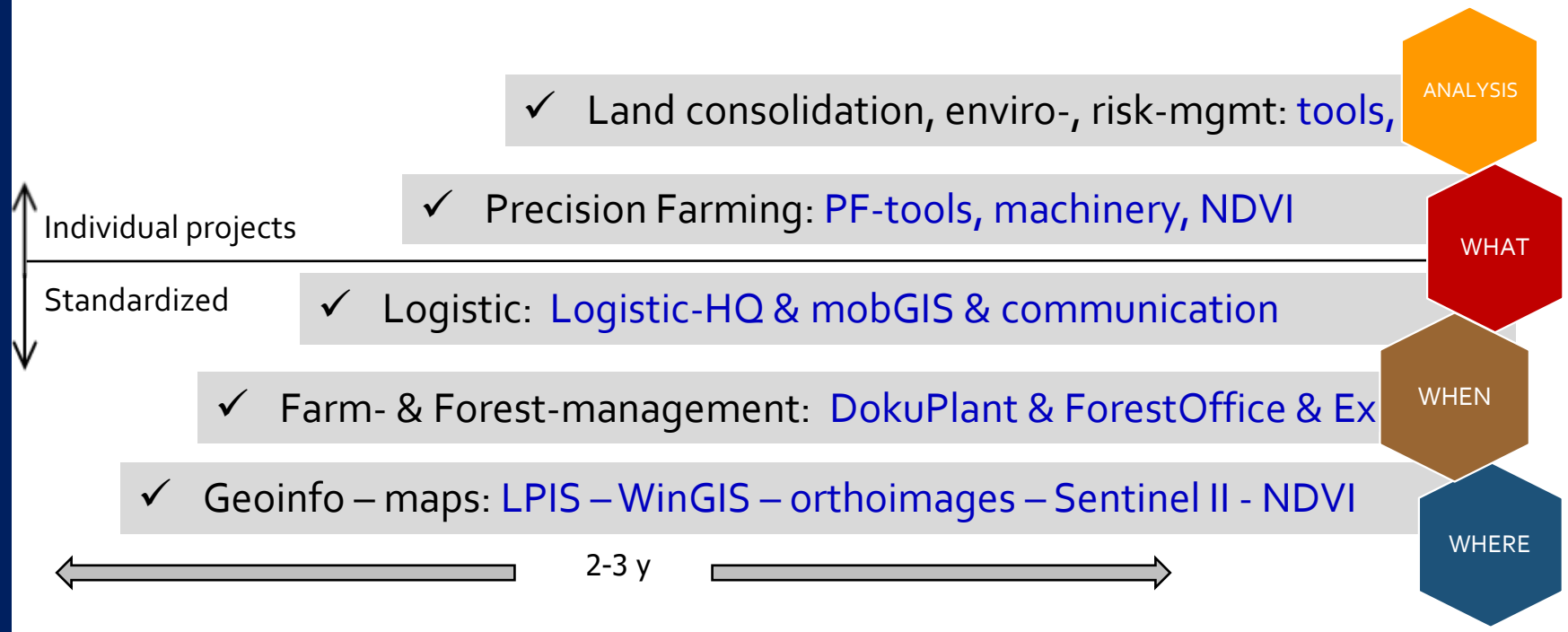
ICT PRODUCTS & PROCESSES

TASKS

TOOLS

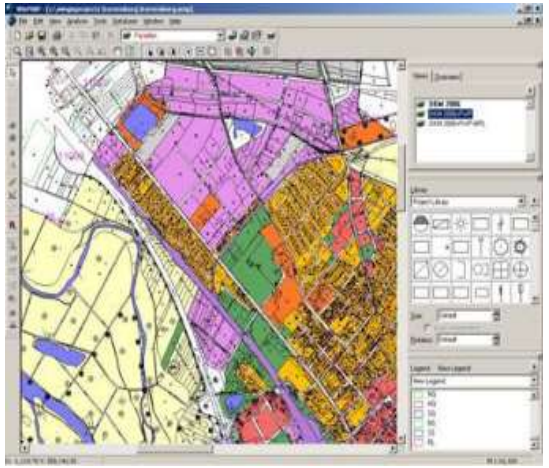
PREPARATION

MILESTONES

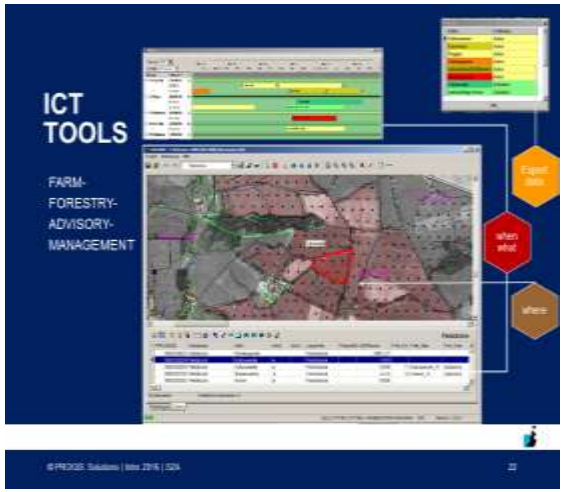


APPLICATIONS AVAILABLE TODAY

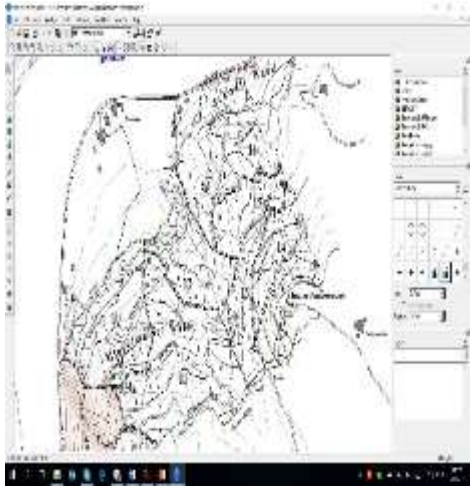
- **WINGIS: Geografical Info System**



- **DokuPlant – Farm-management**

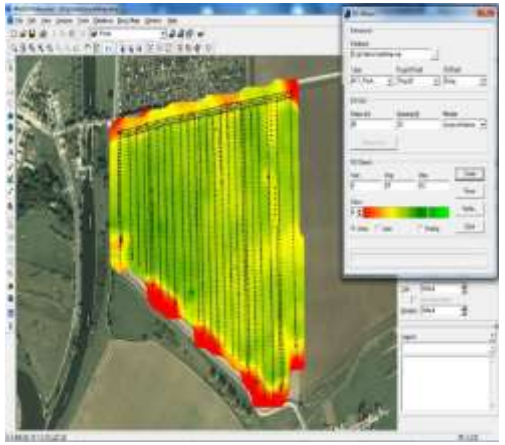


- **ForestOffice - Forest inventory**



- **Technology Integration**

- **Logistics and mobGIS**

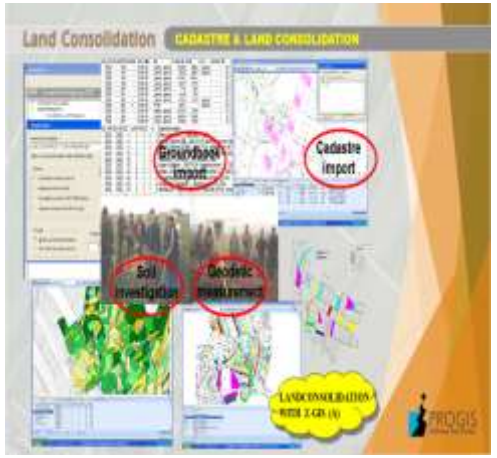


- **Precision Farming (PF) tools**

APPLICATIONS AVAILABLE TODAY

- **Mobile technologies (Apps)**

- **Land consolidation (Apps)**



- **Stakeholder Cooperation (Know How)**

- **Environment and natural risks**
- **(Apps & Know How)**

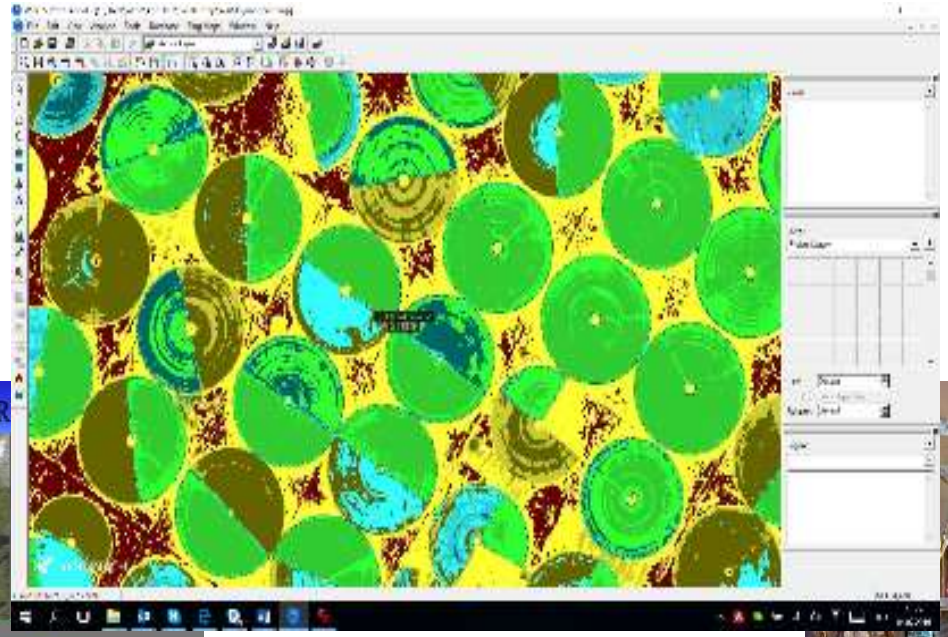
- **Circular Flow Managemnt**
- **+ labs with NIRS technology**
- **+ (Know How)**

- Animal registration - census
- Tagging and documentation of all changes (birth, sales, slaughtering, …)
- GPS based geo-fencing
- Traceability .. to consumers
- IoT ssensors for optimized feeding
- (pH, nutrients)

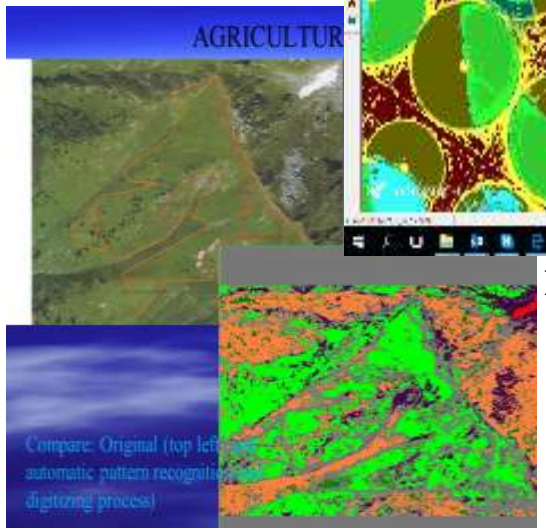
- **Animal Census: registration, identification, tracing, geo-fencing**
- **(Apps & Know How)**

NEW apps & NEW buss.models

NEW: all 5-10 days new pics, globally, see the growth on your phone



NEW: see all details



NEW: EC Sentinel II - growth-index

NEW: Farmer´s gourmet

SDK

NEW: IDIMA pattern recognition

NEW: Franchised food chain: "Gourmet"
Farmer as entrepreneur + i-net + logistics

- Technology & organizational consultancy – entire countries or on demand
- Education models, postgraduate education: farmers, advisors, Universities

40 years ICT in agriculture – forestry – environment – natural risk management
500 man-years of experience

Spill Over Effects

Financial – Real Agri Sector

- Banking
- Insurance
- Industry and trade - Marketability
- Sustainability by priced in externalities
- Service Sector Development (Advisories)
- Health and Elder Peoples Care Facilities, eco-social topics etc.
- Food quality and food waste
- Smart city plus smart rural areas = smart continuum
- Land consolidation
- Environmental caretaking and natural risk-management
- +++++

BENEFITS

Economic – Ecologic - Social

- Location & Time integrated production data for farmers/advisors
  - Save costs and increase income
- Real Time financial data (production data): banks, insurance, MoA
  - Access to finance and insurance
- Risk Management Tools integration for environment & climate
  - Reduce risks, support environment
- Powerful features for enhancement (integrate buyers / suppliers)
  - Increase productivity, sustainability, marketability of production
  - by technology integration and stakeholder cooperation
- NEW: Sentinel based NDVI shows actual growth and forecast
- NEW: IDIMA shows new findings incl. changes "online"
- NEW: Sentinel NDVI + IDIMA shows "videos of change"
- NEW: actual planning, implementation, control, compensation
- NEW: SDK allows worldwide apps to be developed and linked
- NEW: Sentinel+WinGIS+BING+IDIMA+Ph(T)ablet+Windows 10=
  - Lowcost tool for global future planning with local sector-integration!

Organisational Effects

- Public – private

– national – international

- stakeholder cooperation

- **AGRICULTURE – FORWARD THINKING MODEL I**
- **(USABLE FOR OTHER GIS RELATED SECTORS as well as it is a general principle!)**
- **Private ownership** of ground and ownership of information!
- **Responsibility** for the results!
- **Greed**: land-grabbing, giant agro-investments – wrong ROI only!
- **Environment**- and **natural risk** management – who takes care!
- **New technologies** need organizational change!
- **Cooperation needed** for complex problems
- Schumpeter – **Creative Destruction** – no change yet!
- **Technology integration and stakeholder cooperation**!
- **Cross-sector** and **Cross-country** needs!
  - Agriculture – forestry – environment- natural risks
  - many each other influencing other sectors
- **Trust center – Data security – Encryption**!

NEXT steps

- Public + private - coop needed
- Research + practice - coop need
- Cross border solutions – coop need
- Stakeholder integrate – coop need
- Rufugees problem – coop need
- .....

- **AGRICULTURE – FORWARD THINKING MODEL II**
- **Cooperation Research and Practice** urgent needed
  - Multidisciplinary Research
- **Agriculture decision-makers are not aware of IT possibilities**
  - Agro-decision-makers block – no or to less know how
  - No education in geodesy and photogrammetry???
- Due to competition fast decision needed – "**first wins**"
- Link to **education** and refuges problem possible – concepts clear
- Europe/US and other **continents needs better cooperation**:
  - We need changes – fast!!!!
  - Speed must be increased dramatically to avoid future problems!
  - Food and environment is borderless!!!!
- **Agro-Forest-Environment-natural risks can be the fundament for a political paradigm shift urgent needed!**
  - **Common sense comes from education by nature**

NEW 2017

WinGIS LUMEN REAL

- Tablet-PC
- WinGIS LT
- MS Bing Maps orthophoto
  as background (30cm resolution)
- LPIS Data Import (IACS/Invekos)
- Sentinel II Pictures(10m resolution)
- 5-10 daily update frequency
- NDVI growth index

39 p.m

This example shows growth differences of up to 60%
WHY ?

mobGIS

29 p.m

- Q 4/2017
- Upgrade from WinGIS LUMEN to
  mobGIS with access to central Logistic database
- receive your logistic orders directly on the tablet
- The control center constantly sees all machines
  on-screen with any update frequency of 30 minutes and
- receives a log of the billing (km, ha, h)

OTM (Open Transport Map)
OSM (Open Street Map)

19 p.m

Q 1/2018

With the possibility to digitize your rural path
(agriculture, forestry, alpine meadows)
and to link them with attributes
(width, max. t., max. height, blocked from t bis t,
curve radius.....)

LUMEN WinGIS by PROGIS

INTERPRETATION DATA FROM SPACE

- **WinGIS LUMEN**
- **+ Tablet Windows 10 + Android + 4GB**
- **+ WinGIS-LT**
- **+ Bing maps (JRC certified)**
- **+ EC Sentinel II + NDVI**
- **+ for all fields worldwide**
- **+ update all 5-10 days**
- **.**
- **.**
- **.**
- **.**
- **2017:**
- **IDIMA change-detection**
- **NDVI +35 – soil line**
- **Forecast - different crops**

I	A
E	I

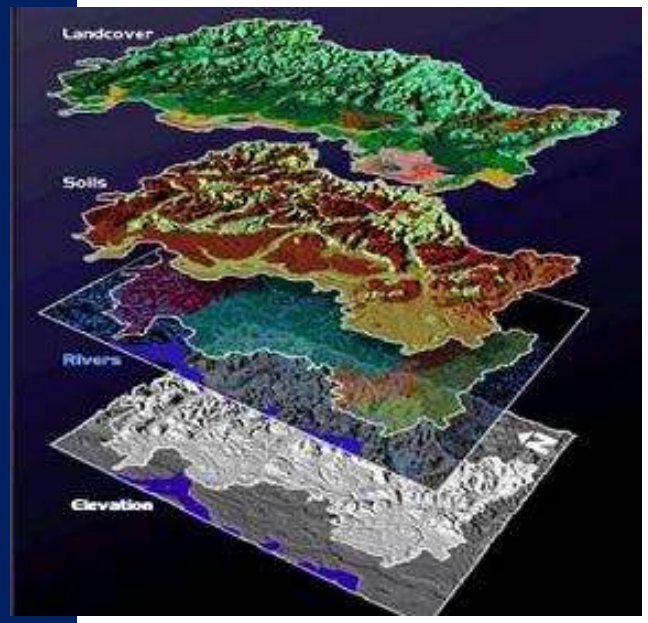
PROGIS Software GmbH

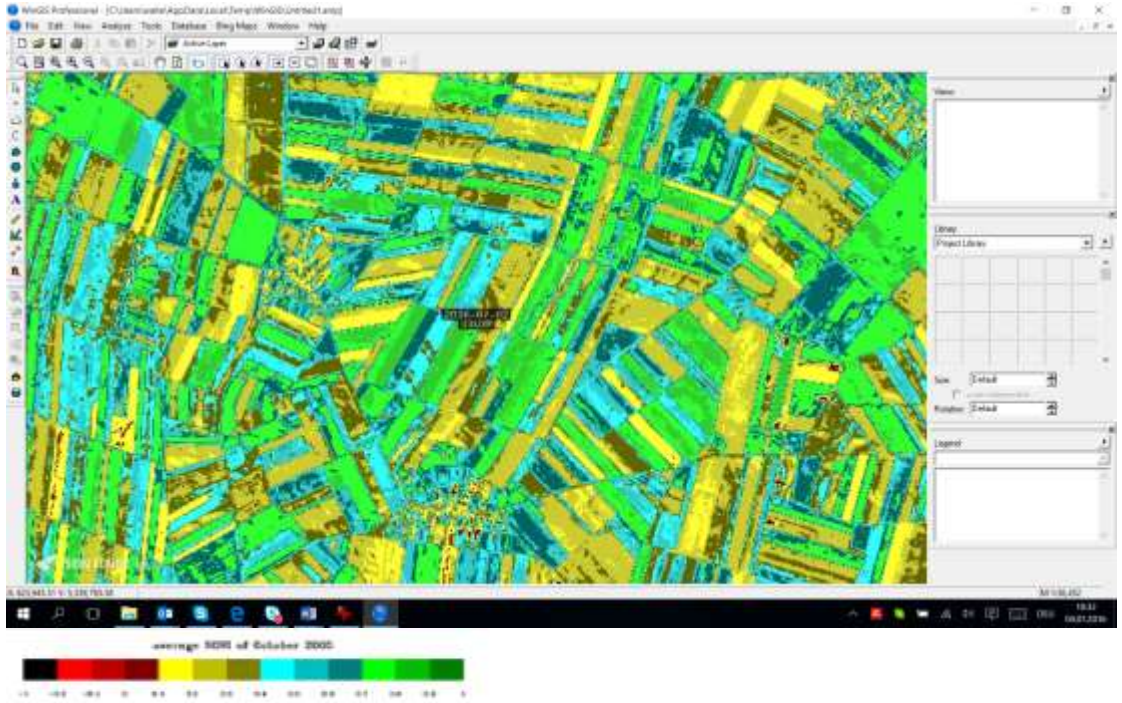
WinGIS

LUMEN Real

Sentinel II NDVI

GIS Layers





LUMEN REAL

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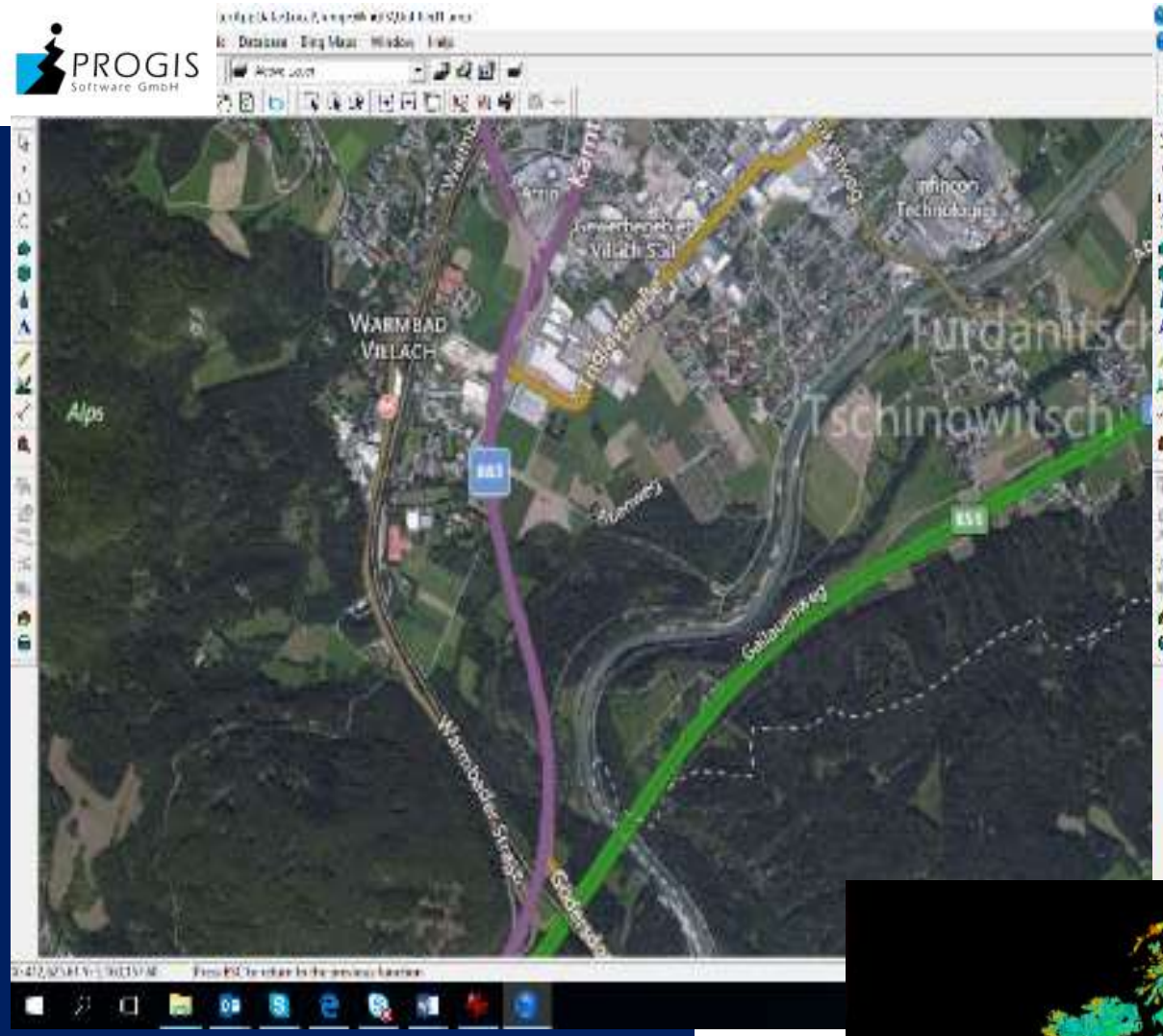
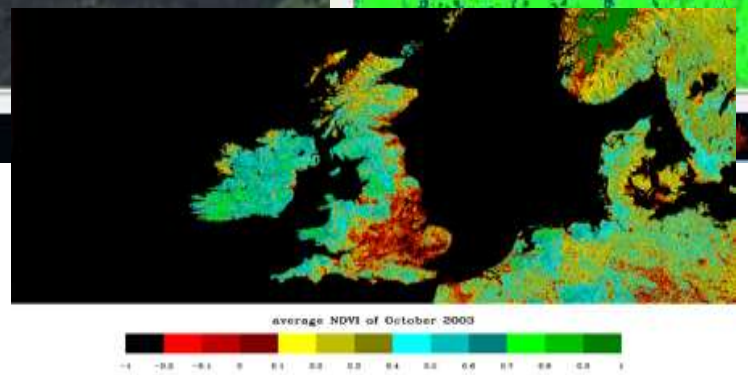
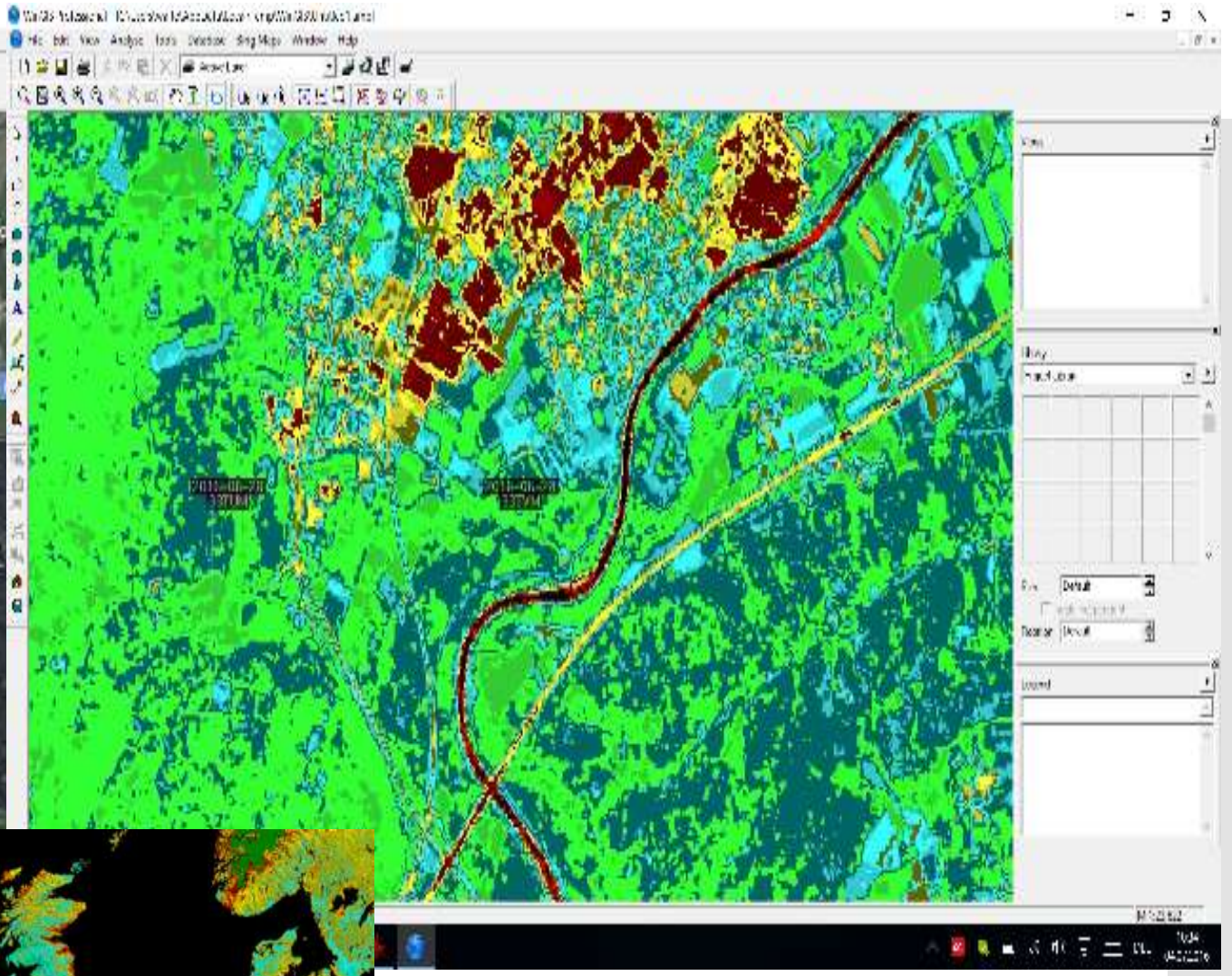
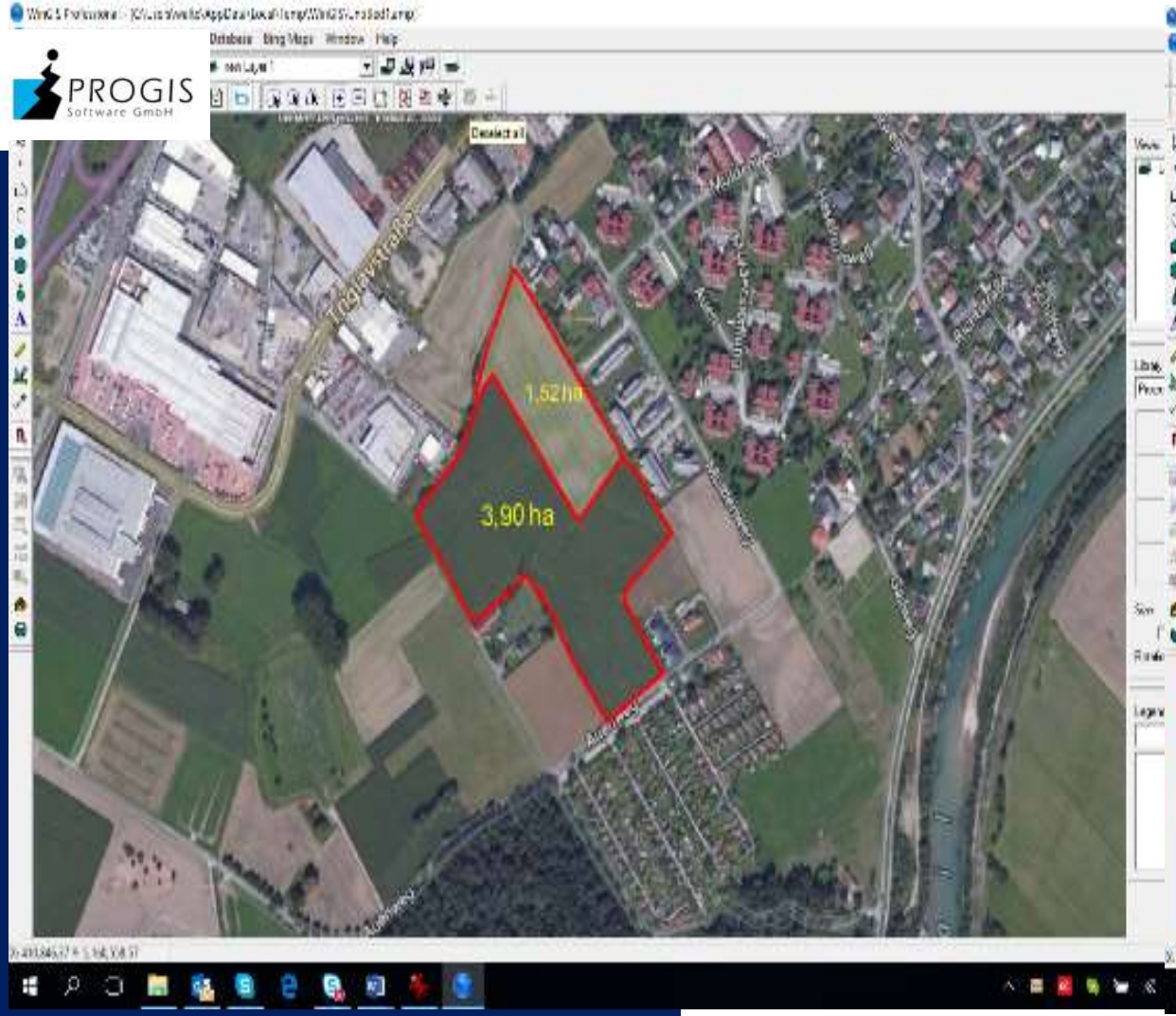


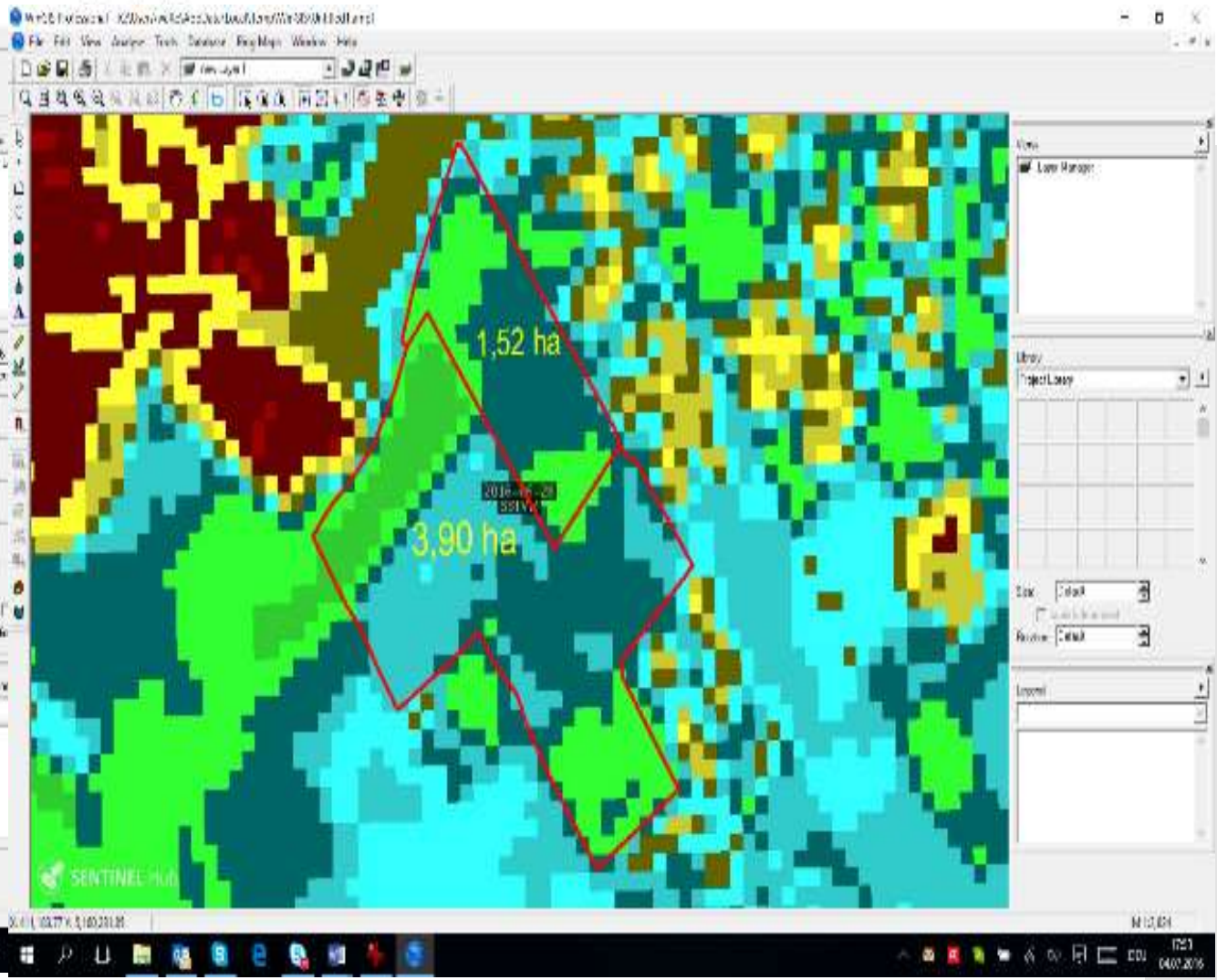
Orthoimage – Villach/A South





NDVI Index - Villach/A South





Orthoimage 25cm + LPIS polygons (either via Ministry or digitized or GPS-Import)

NDVI Index from 0,4 – 1,0 in one field! Why?
New all 5-10 days, mail info if new!

WinGIS + SDK + IDIMA + DATA (Bing map, Sentinel II, new)

WinGIS	powerful object oriented GIS system
Integrated SDK	develop own applications - AX-enabled database, link to WinGIS "hidden" mode
IDIMA (2017)	automatic identification and vectorization tool to "read" content out of images that eyes will never see
MS BING maps/others + LPIS	worldwide base map (vector and raster (EU/US 24 cm res ortho-photo, other 1-2 m satellite images, permanently upgraded) + EC LPIS data - anonymous
Sentinel II	Sat images – 10m resolution - Update frequency 5-10 days
NEW (daily update 2018-19)	Sat images – 5–1m resolution – Update frequency 24h
Applications	Farm- and Forest management Logistics, Advisory service management, Land-consolidation, Environment- and natural-risk-management, Trust center, Encryption

LUMEN

Applications

Apps Apps Apps Apps Apps

SDK

© PROGIS Technologies

FOODIE:

Farm
Oriented
Open
Data
In
Europe

EC funded project
2014 – 2017
grant 621074
6 Mio € project

CHALLENGE

The agriculture sector is a strategically unique sector which should ideally be constituted by a network of interacting organizations. In carrying out their activities, such stakeholders have to manage many different and heterogeneous sources of information, such as:

- definition of policies,
- valuation of ecological performances,
- development of sustainable agriculture, crop recollection, and definition of timing and pricing,
- plagues detection.

In this context, future agriculture knowledge management systems not only have to support the direct profitability of agriculture or the environmental protection, but also have to combine and coordinate the efforts and the behaviours of the agri-food industry, consumers, public administrations and wider stakeholders communities.

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BIM piave www.consorziobimpiave.bl.it

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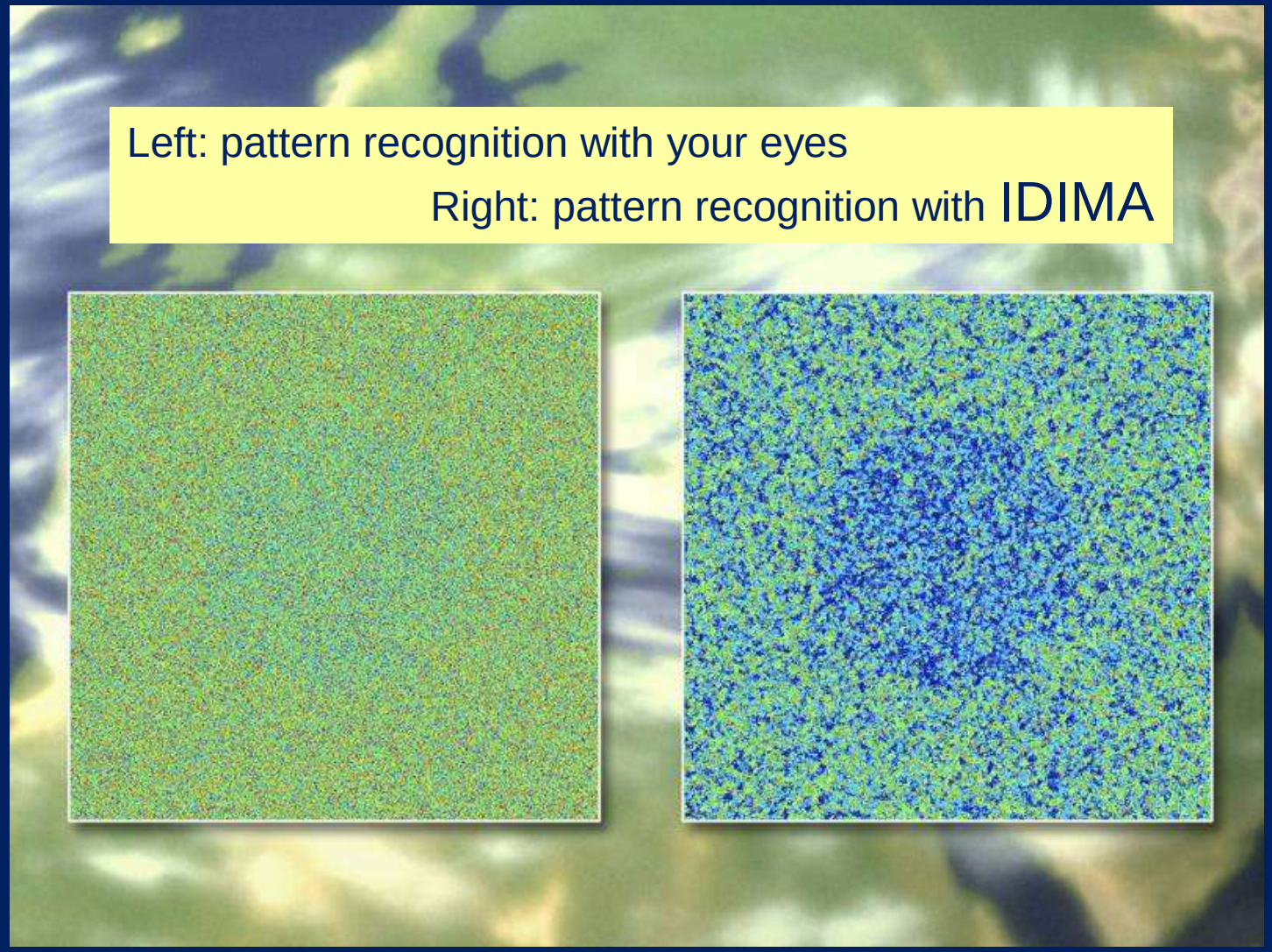
FOODIE

FARM-ORIENTED OPEN DATA IN EUROPE

This project is partially funded under the ICT Policy Support Programme (ICT PSP) as part of the Competitiveness and Innovation Framework Programme by the European Commission under grant agreement no. 621074

CIP-ICT-PSP-2013-7 Pilot Type B

Pattern recognition with **IDIMA**



AGRICULTURE

Original picture – BING image 25 cm ortho-retified - Austrian Alpine farm in Styria (red lines: you see also the incorrect manual digitizing process!!!)

IDIMA [IDentification of IMAges]

WINGIS + BING + IDIMA

A classification module creates an objective classification

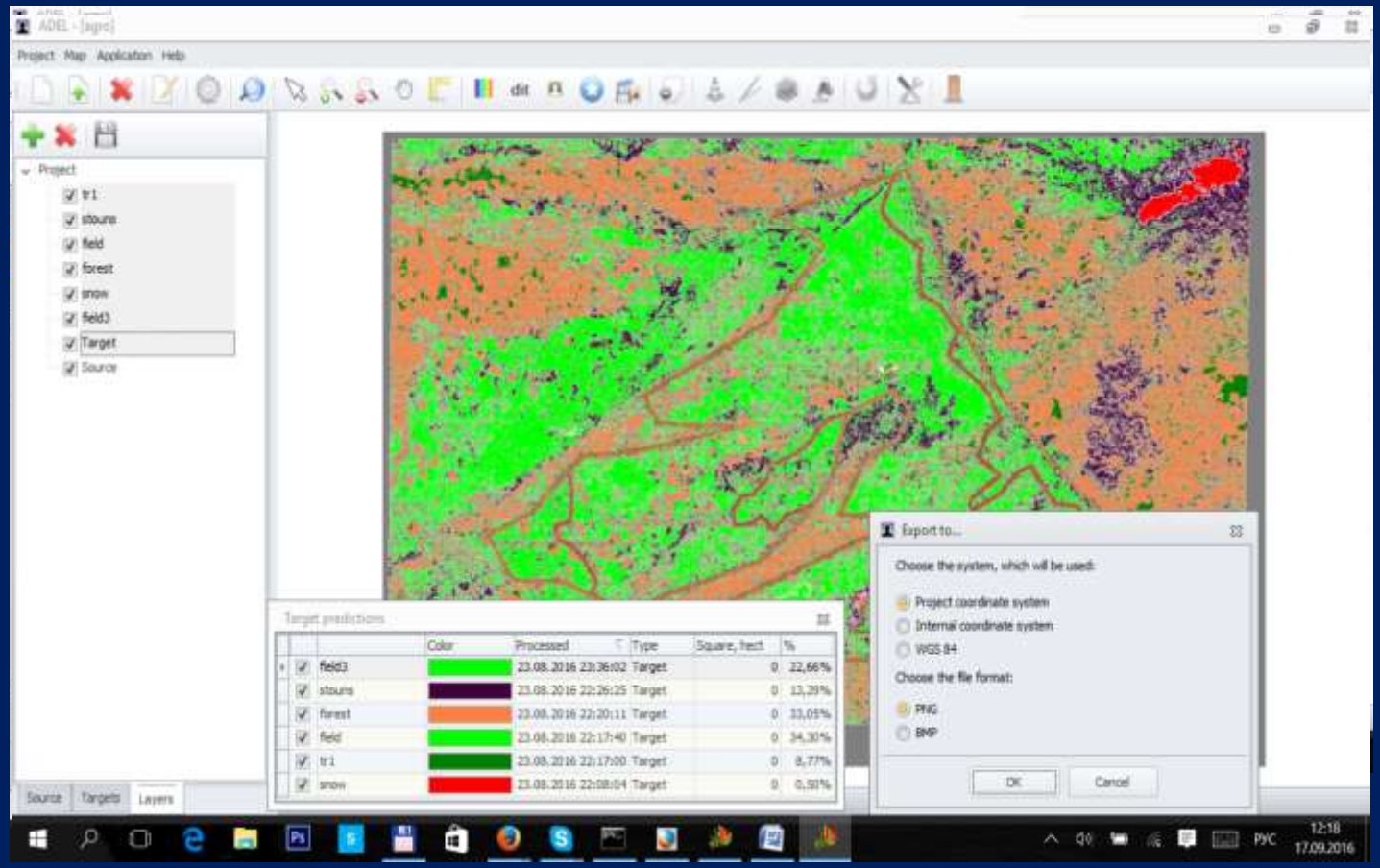
Loading source image & define projection & coordinates

Selecting parameters for classifying Consistent Structure

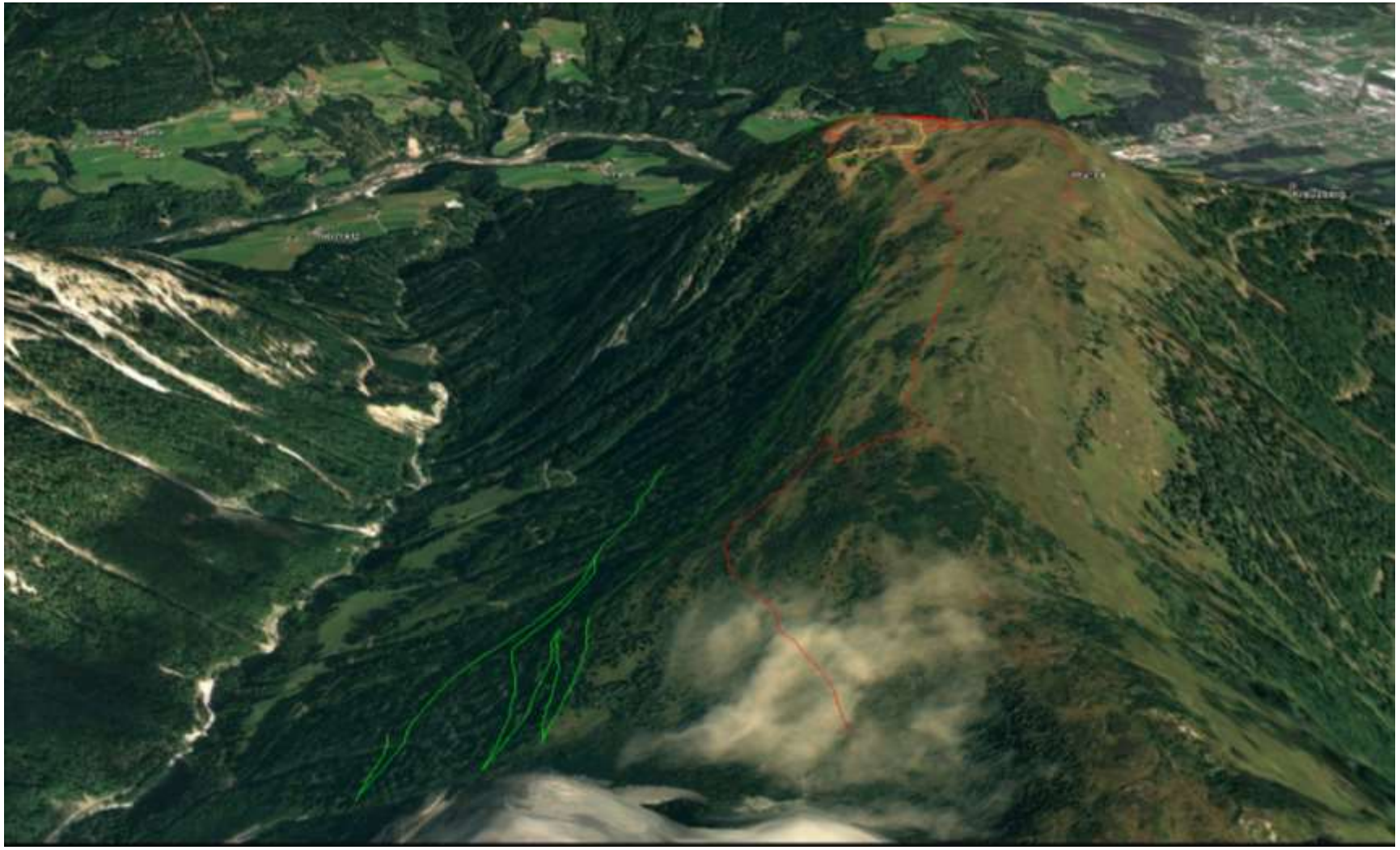
Automatic classifier mode creates a classified structure

Setting targets for creation of thematic raster maps

Exports the raster map for the automatic vectorization



Roadnetwork in the mountains 3D



View from SSW

Roadnetwork in the mountains

View from NO

QUESTIONS
ANSWERS