



# Territorial Planning and Management

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# Remote Sensing Centre



What we do?

In situ

Data collection



Research topics



Calibration and Validation of Earth Observation data



Forests



Agriculture / Drought



Land-Cover / Land-Use



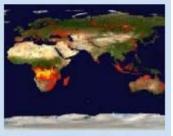
Bioenergy and carbon balance



Climate changes



Wetlands and grasslands



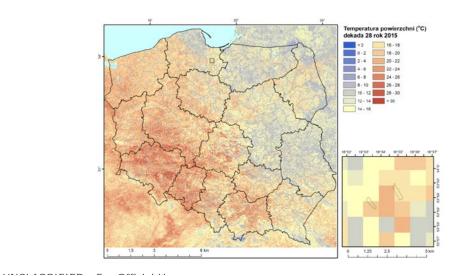
**Environmental Hazard** 

http://www.igik.edu.pl/en/remote-sensing

# Agriculture

# Thermal Condition Index - TCI

$$TCI = 100 \times \frac{T_{\text{max}} - T_{\text{akt}}}{T_{\text{max}} - T_{\text{min}}}$$



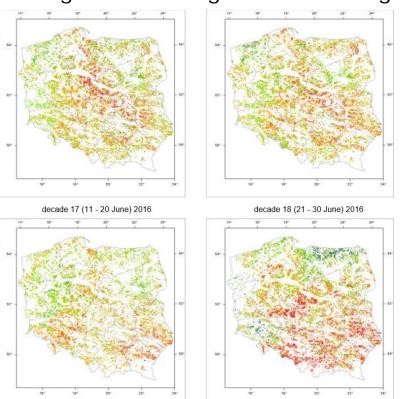
REMOTE SENSING BASED SYSTEM OF CROP CONDITION ASSESSMENT KAW NDAA AVERE SATELLITE DEAGE CAPTURED BY OPOLIN-IGIK STATION SET OF NOVA BRAGES OF POLAND COLLECTED WITHIN 15TH DECADE OF 1999 GROWING SEASON BAS BEEN PREPARED WITHIN JOINT PROJECT, CONSCICTED BY THE POLISIS NAME AND PERSONS OF PROPERTY AND PERSONS ASSESSED AND ADDRESS OF THE PARTY OF THE P REMOVE MONING AND SPATIAL PROBRESTION CENTRE IN COORDINATION CONFIDENTIAL PROCESS, NAME, CRAPBE AND EARLIESTED WITHOUT FROM THE SYSTEM CONFIDENTIAL BASEAUASE, CONSISTING OF I AN GLOBAL, LAND BASEA COLLECTED WITHOUT GLIP PROCESSAINE. WITH THE CANADA CENTRE FOR REMOTE SENSOR AND DITERMAT COMPANY THE STOTEM IS BASED ON CHING FROM YORK AVERE DATA, WHICH ARE WAS CONSTRUCTED HIR POLAND'S AREA. COLLECTED BAILY TO PRODUCE IN OAY VEGETATION PLOCS COMPOSITOR IN THE COURSE OF PRIV. THE CASPATHG SENSOR THREE SETS OF NOAA NAV. CONSPONITS WERE PREPARED AND THE REPORTS WHEE PRODUCED NO. THE CUSPONICES SOFTWARE, BASES ON PCI PSCHAGE, MASSESS PREPARED FOR COMPRESSIONS PROCESSING OF BAN MOLA AVERS BLACES, ER. FOR PARTICULAR ADMINISTRATIVE UNITS IN POLAND, THE OLUME IS PROVE THE POLICE CHOP CONDITION ASSESSMENT STITTED WERE OPERATIONALLY DELIVERED TO THE CENTRAL STATISTICAL OPING, TO BE PURITHER ANALYZED BY DECISION MINARIES AND ELIVESTICAL SPECIALISES. GEOMETRIC, RAMONETRIC AND APMOUPEERS' CORRECTEDS, 45 WELL AS FOR CLOCK TREESBOLDING AND NOTE DESCRIPTIONS TEN-BAY VEGETATION INDEX - NOVI COMPOSITE IMAGE.

decade 19 (1 - 10 July) 2016

# Agriculture

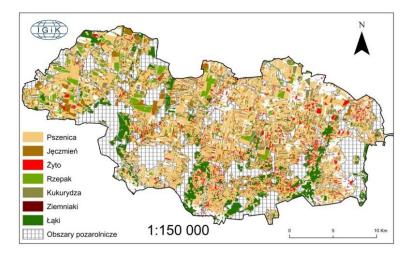


## Drought forecasting and monitoring



decade 20 (11 - 20 July) 2016

## Crop recognition Yield forecasting





average condition

good condition

drought drying

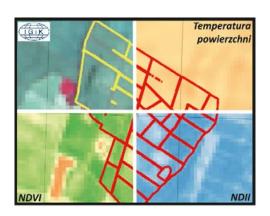
# Agriculture service



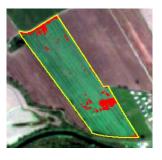


ASAP - Advanced Sustainable Agricultural Production Web-based service for individual farmers and administration developed under the ESA ARTES 20 IAP Programme

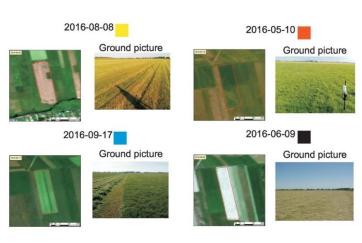
**AIM**: development of the satellite based System and Service in a form of one-stop-shop platform for Agriculture Sector in Poland and further in Central Europe



NDVI, NDII, RGB composite, etc. (Sentinel 2); LST (Landsat)



Problematic areas



Continuous field monitoring - Sentinel-2

# Agriculture service



### Products portfolio for all User:

- Image RGB composites
- Maps of droughts (for each decade)
- Maps of snow cover (for each decade)

### Products portfolio for registered Users:

- Maps of NDVI since 2015 (Landsat 8 + Sentinel 2)
- Maps of NDII since 2015 (Landsat 8 + Sentinel 2)
- Land surface temperature (Landsat)
- Map of yield potential
- Map of problematic areas
- Map of homogenous polygons
- Crop conditions
- Products on demand



### ASAP - satelity w służbie rolnictwu

Partnerzy:





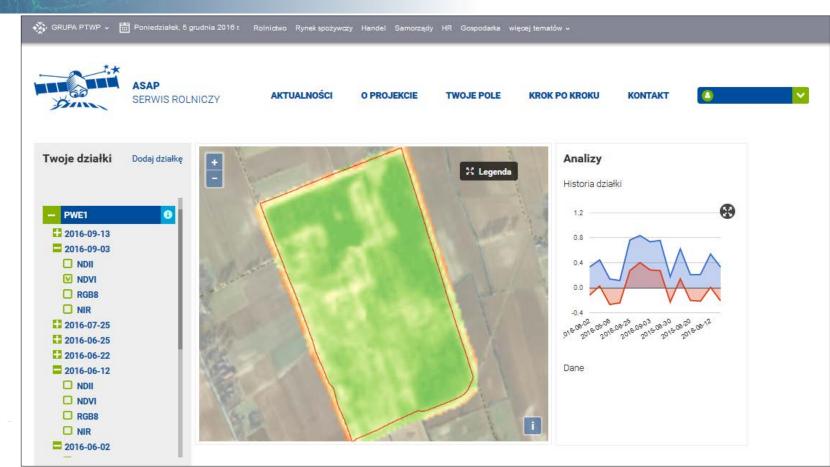




# Agriculture service



After registration:



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# Bioenergy service





SERENE Project - Bioenergy as the key to economic growth of the regions - EO Based Service Supporting Energy Crop Cultivation – project funded by ESA (1.04.2014 – 31.05.2016)

**AIM**: Assessment of actual information on the energy biomass availability in the regions through developing methodology for energy crop classification and developing models for energy crops biomass retrieval based on Landsat 8 data



**SYENERGY** is satellite based on-line tool for management of energy biomass in Poland based on Sentinel-2 data





### **End-Users:**

- energy suppliers including individual farmers (planters)
- companies which established the energy crop plantations for their own use
- energy recipients at local, regional and national scale
- energy biomass recipients

# Bioenergy service



## Three main components of the System and Service:

### LOCAL BIOMASS

### PLANTATION STATUS



### SUSTAINABLE DELIVERY

Location	Poland,
	Zachodniopomorskie
Energy crop type	WILLOW
Total area of plantation (ha)	64,9
Total area of energy crops (ha)	48,4
Area of damaged crop	16,5
% of damaged crops	25
Average biomass t/ha	26,67
Yield (dry biomass)	13
Distance from the closest protected area	6 km (Brzeznicka
Natura 2000 (Habitats directive)	Węgorza)
Distance from the closest protected area	1,5 km (Ostoja Drawska)
Natura 2000 (Birds directive)	1,5 km (Ostoja Drawska)
Distance from the closest protected area	32 km (Drawieński Park
National Park	Narodowy otulina)
Distance from the closest protected area	10 km (Iński Park
Landscape Park	Krajobrazowy)
Distance from the closest protected area	13,5 km (Jezioro
Reservate	Czarnówek)
Distance from the Energy Producer premises – straight line	85,8 (Szczecin)

## Wetlands service

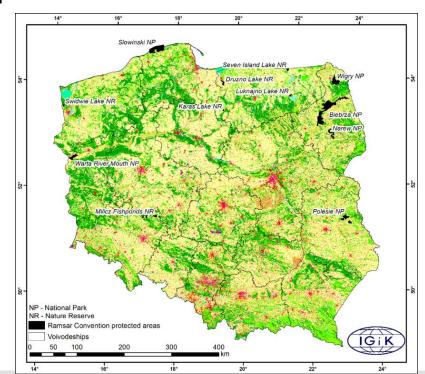




**POLWET** Project - System for new space-based products for wetlands under Ramsar Convention — pilot Project for Poland supporting future GlobWetland"

(1.07.2015 - 30.06.2017)

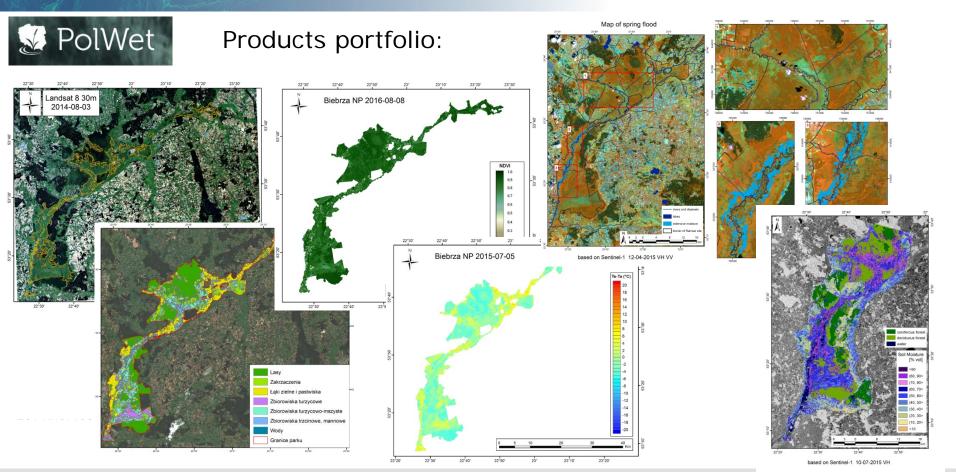
**AIM**: development of the satellite based System and Service for monitoring and management of the Ramsar areas in Poland





# Wetlands service





# Forestry service



**SAT4EST** - Earth observation based service supporting local administration in non-state forest management (1.03.2017 – 30.02.2019)

## **Objectives**

- To prepare EO products that will meet the user requirements.
- To demonstrate how EO products can be integrated with ancillary data.
- To design and develop web-based service for forest management.
- To implement the service in the selected districts.
- To promote the use of various Copernicus data.

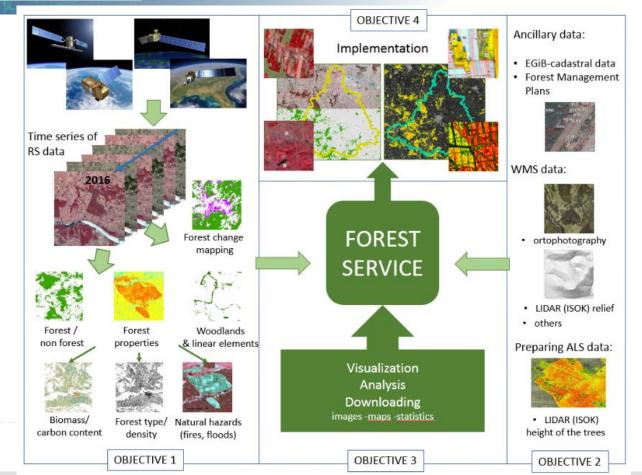
Forest in Poland - 91,630 km<sup>2</sup>, which is 29.3% of country. State Forest - 77%, the rest belongs to national parks, private owners and cooperative owners.



# Forestry service



## **SAT4EST**





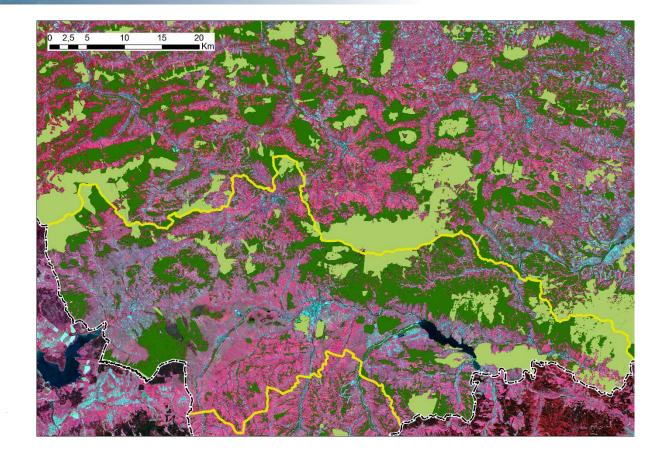


# Forestry service



## **SAT4EST**

Sentinle-2





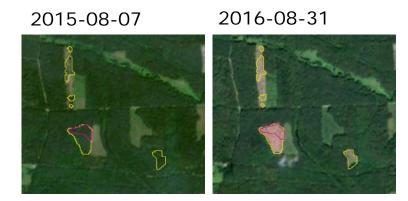
# Forestry service



### Use of Sentinel data



Forest affected by the strong wind near Supraśla 17.06.2016



Detecting and monitoring clearcuts



# Forestry

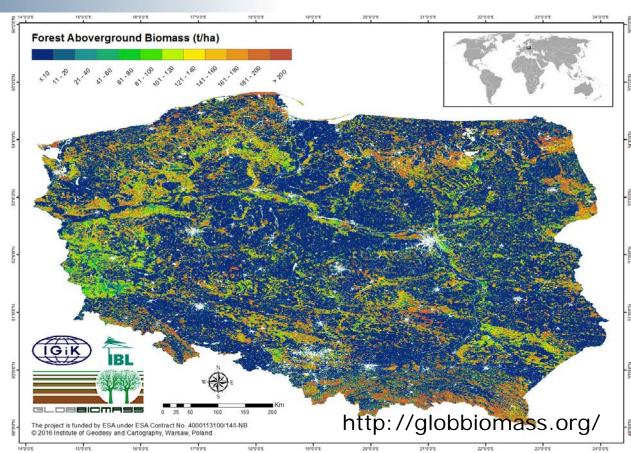




## ESA DUE GLOBBIOMASS

Leader: Department of Earth Observation -Friedrich-Schiller-University Jena





# Conclusion and Perspectives CSa



- Development and verification of the methods, tuning models is still needed.
- Methods should be standardized, robust, documented, validated to be considered and accepted by decision makers.
- Work closely with end users; prepared EO products that meet the user requirements (e.g. accuracy, timing, MMU)
- Connection of EO research, business and administration is challenge there is no official regulations that would encourage to apply EO methods
- Big challenge is to increase awareness of various decision makers, authorities, politicians at national, regional and local level towards the Earth Observation data and technology. This would result in better EO data uptake.
- Marketing at various level is very important



## Thank you for your attention

More information about our activities and projects:

http://www.igik.edu.pl/en/remote-sensing

Contact: agata.hoscilo@igik.edu.pl

























