

Copernicus products within the Czech Integrated Drought Monitoring System

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Outline

- About Global Change Research Institute CAS (CzechGlobe)
- Integrated Drought Monitoring System (InterDrought/InterSucho)
- SWI in InterDrought
- Yield prediction
- Validation
- Summary

Global Change Research Institute CAS (CzechGlobe)

- Brno, Czech Republic
- Focused on development of climate and its future scenarios, carbon cycle, effects of changing conditions on the production and biodiversity of ecosystems



Department of climate change impacts on agroecosystems

- Assessment of climate change impacts on cultivation of main crops
- Monitoring of phenological development of crops and woody plants
- **Agricultural drought analysis and monitoring**

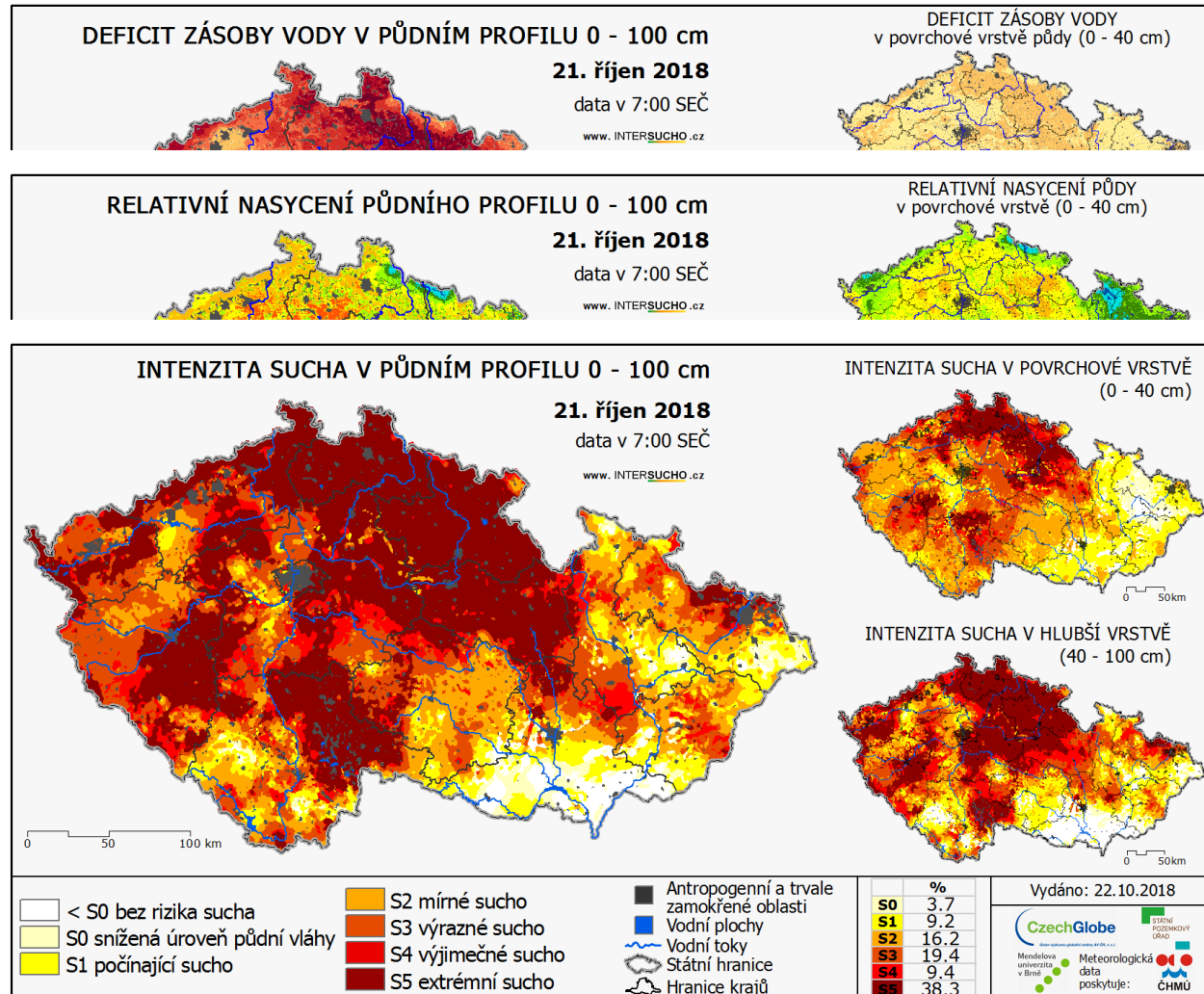


Czech Integrated Drought Monitoring System

- www.intersucho.cz
- Monitoring drought in the Czech and Slovak Republic + Central Europe
- 3 pillars of monitoring:
 - Model SoilClim
 - Cooperation with agricultural experts
 - Satellite data

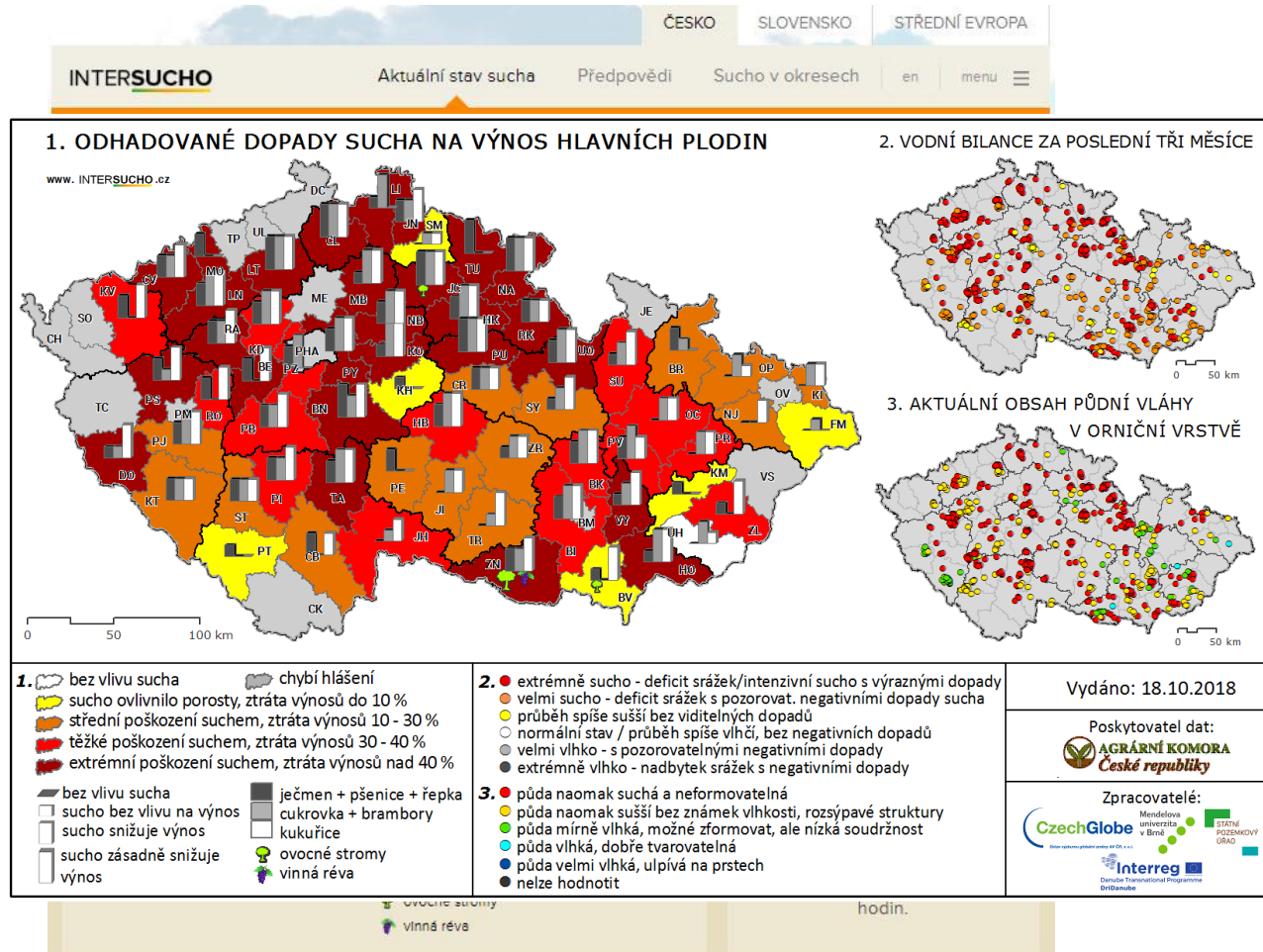


Intersucho – I Model SoilClim



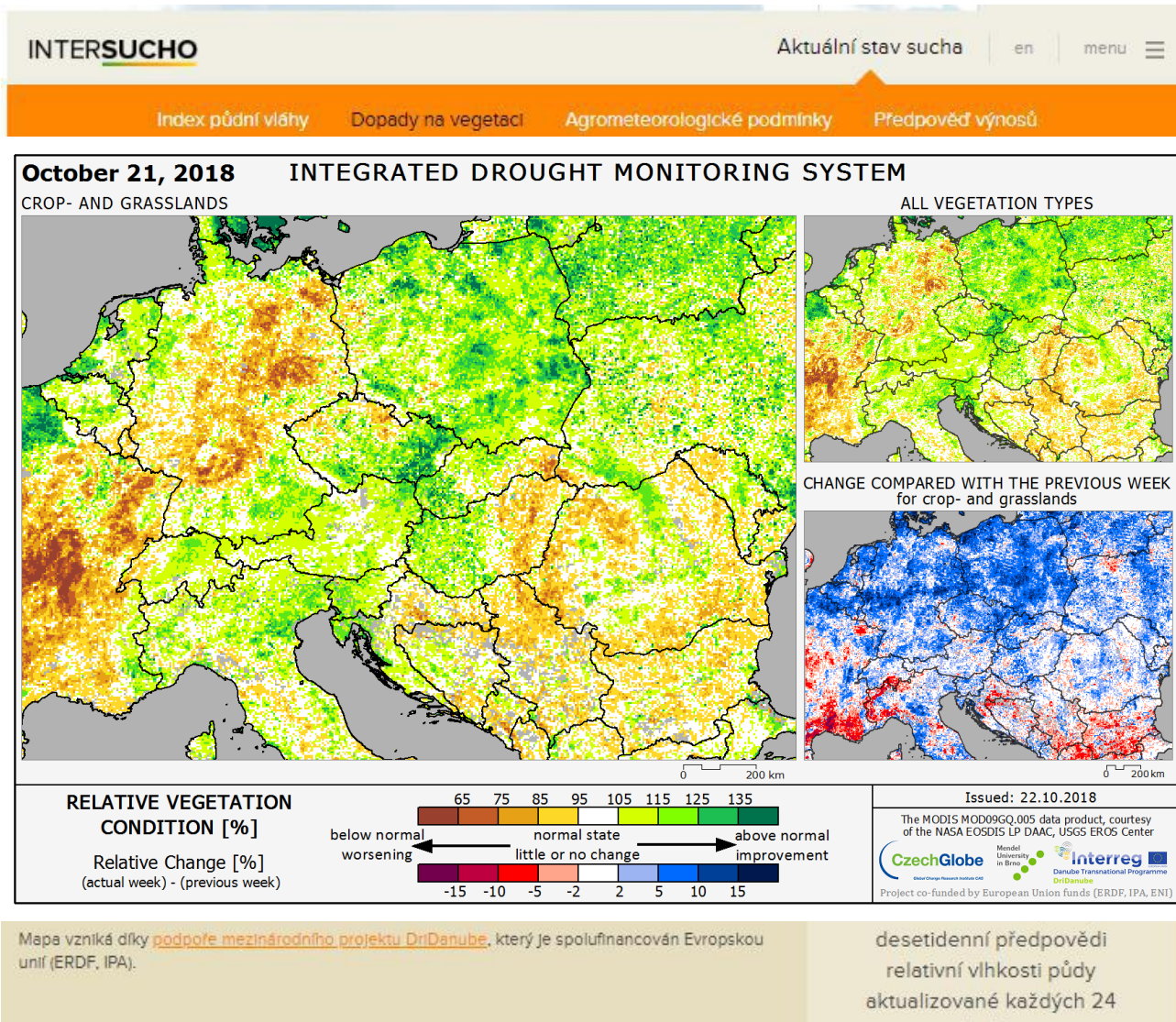
- Water balance model based on meteo data, vegetation cover, phenology, soil and spatial characteristics (slope, aspect etc.)
- Soil moisture deficit, Relative soil saturation, Drought intensity
- Published weekly, grid 500x500 m
- Soil depths 0-40, 40-100, 0-100 cm

Intersucho – II Cooperation with agricultural experts



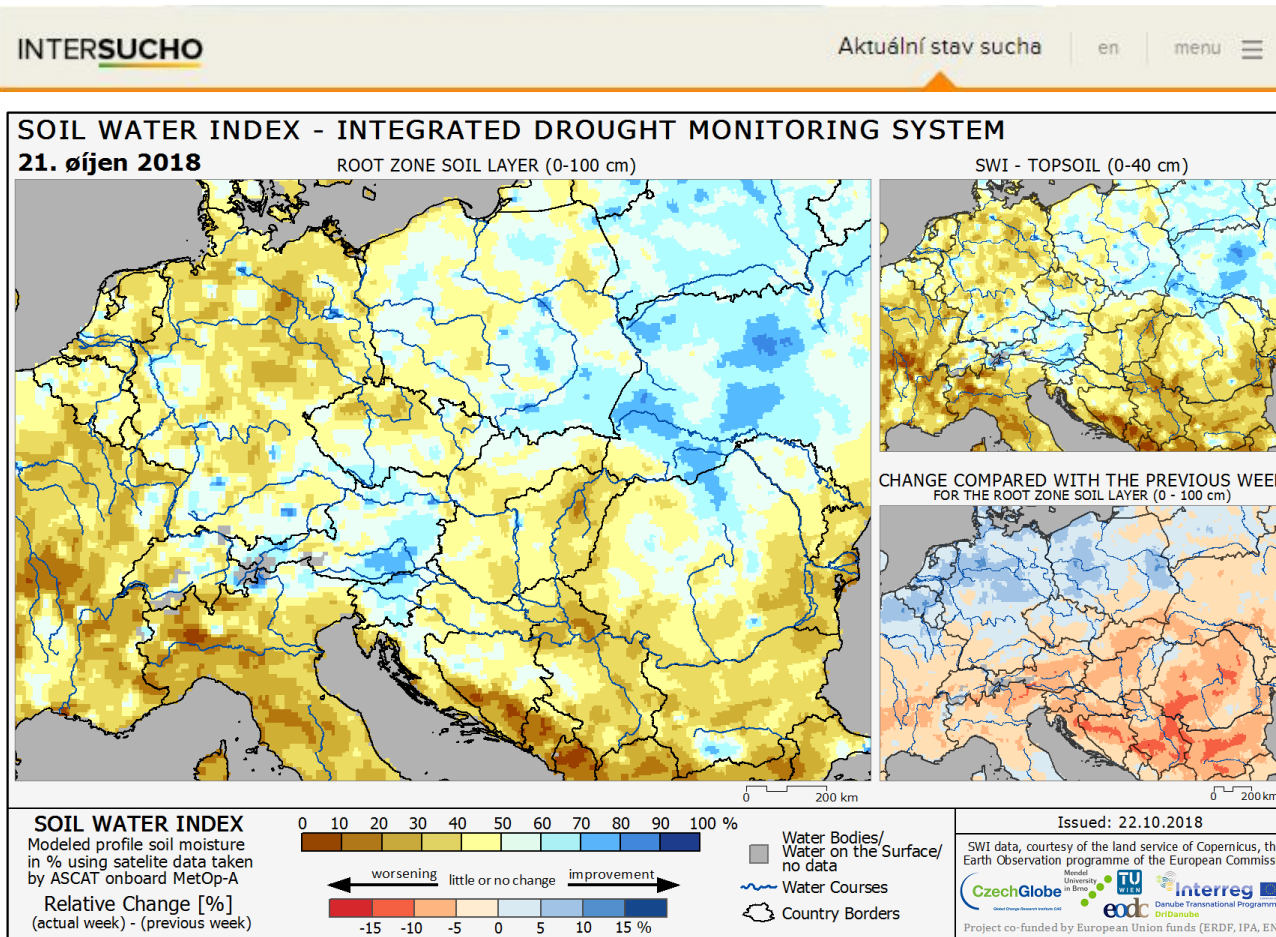
- Data collected weekly from more than 220 agricultural experts
- Simple online questionnaire
- Information about soil moisture and drought impacts on crops on concrete locations
- Aggregated to LAU1 level

Intersucho – III Satellite data



- Relative Vegetation Condition
Product based on daily MODIS Surface Reflectance (250 m)
- Condition of all vegetation types and croplands + grasslands
- Change compared with the previous week

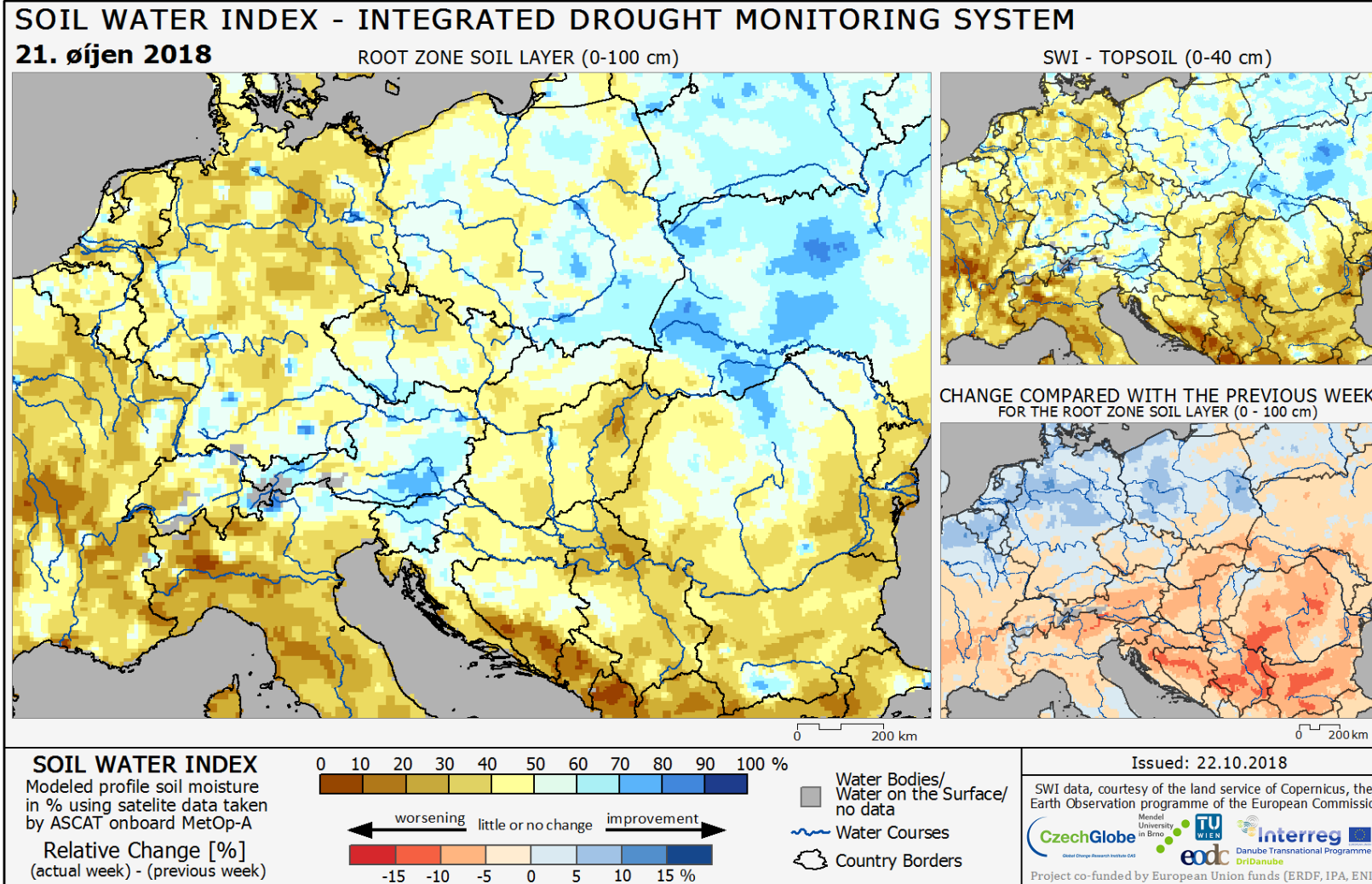
Intersucho – III Satellite data



- SWI weekly average values based on daily SWI data
- 0-100cm and 0-40cm
- Change compared with the previous week

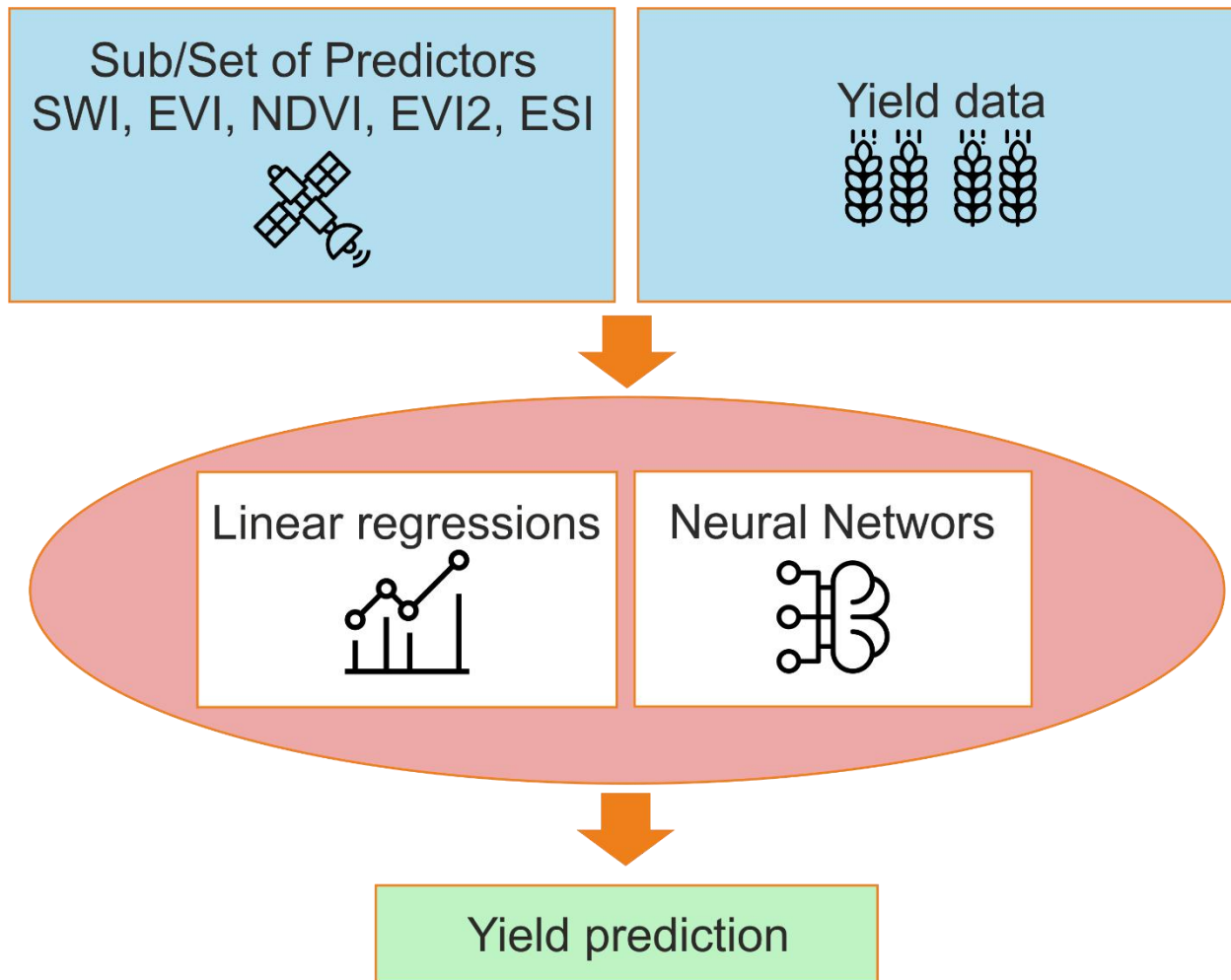
Mapa vzniká díky [podpoře mezinárodního projektu DriDanube](#), který je spolufinancován Evropskou unií (ERDF, IPA).

vypíseň expertního
dotazníku získáte přístup k
desetidenní předpovědi
relativní vlhkosti půdy



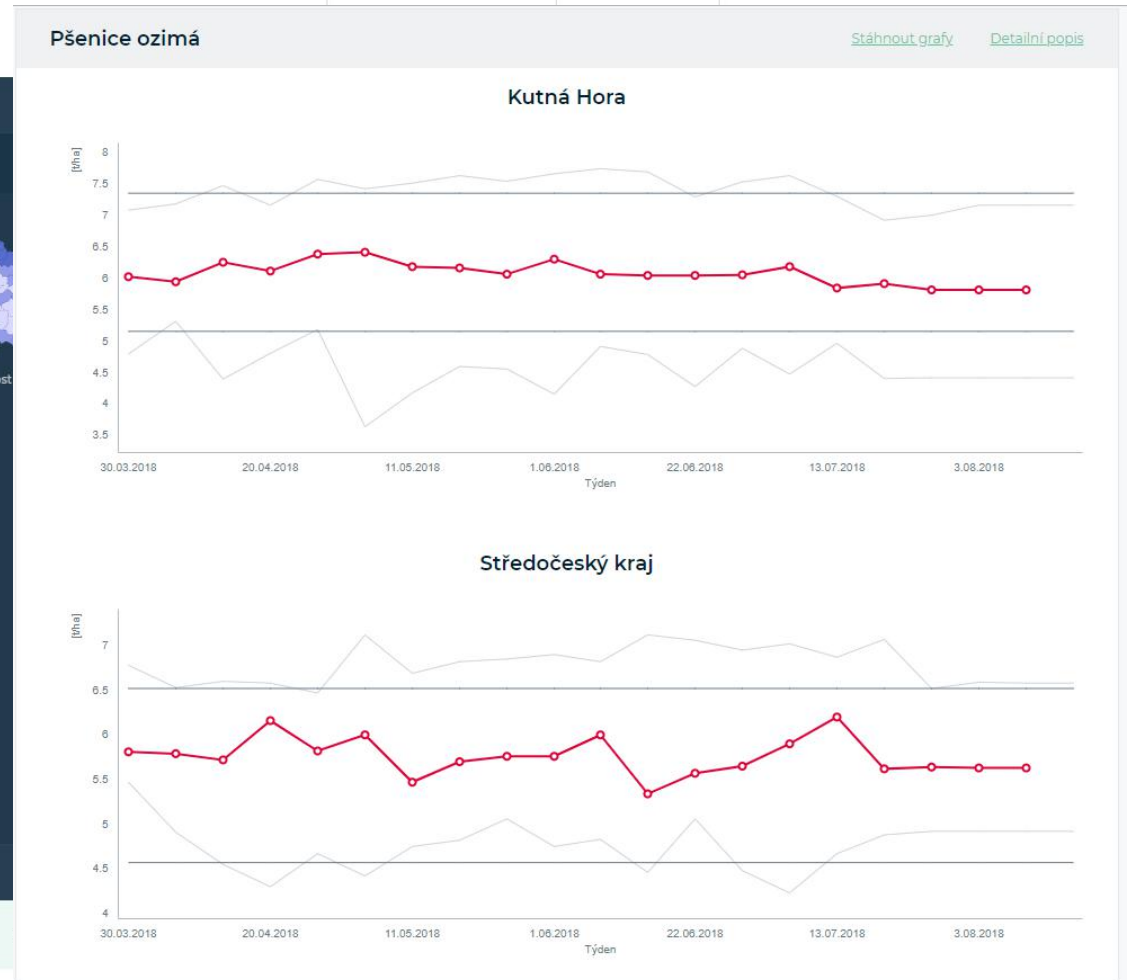
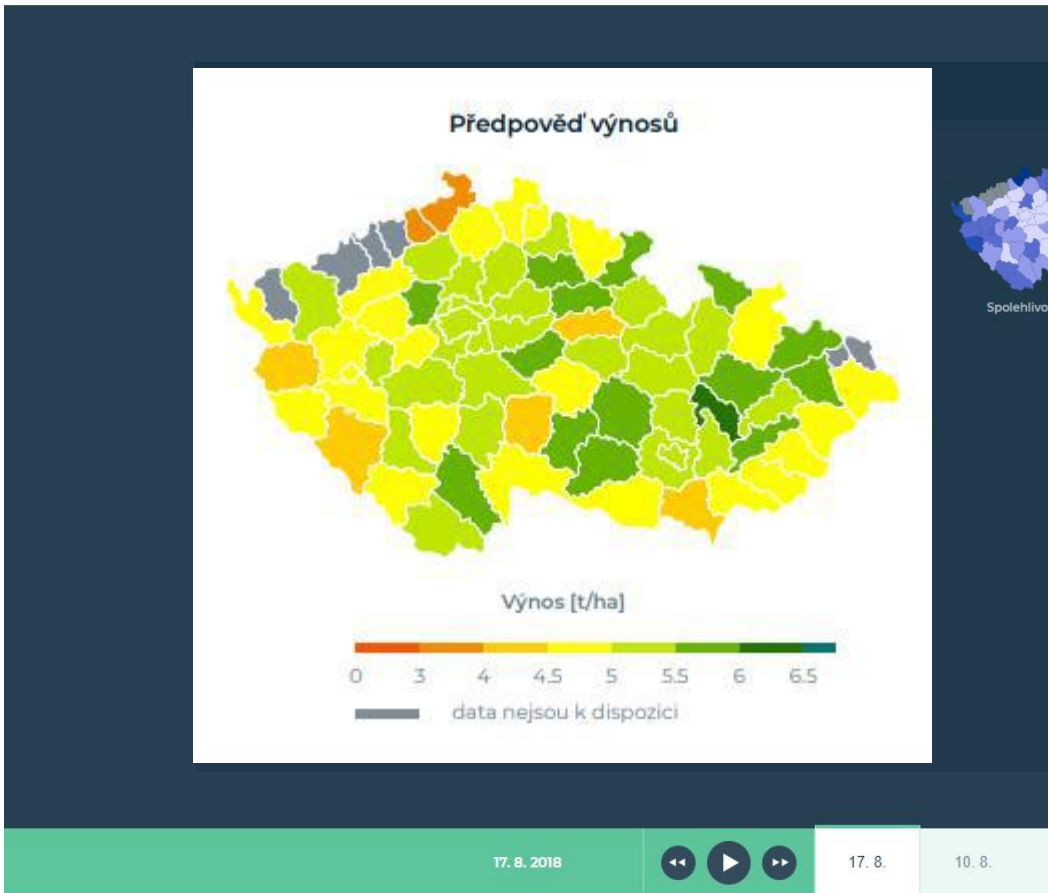
- Maps published weekly at www.intersucho.cz
- Also as input data for other products

SWI - Yield prediction



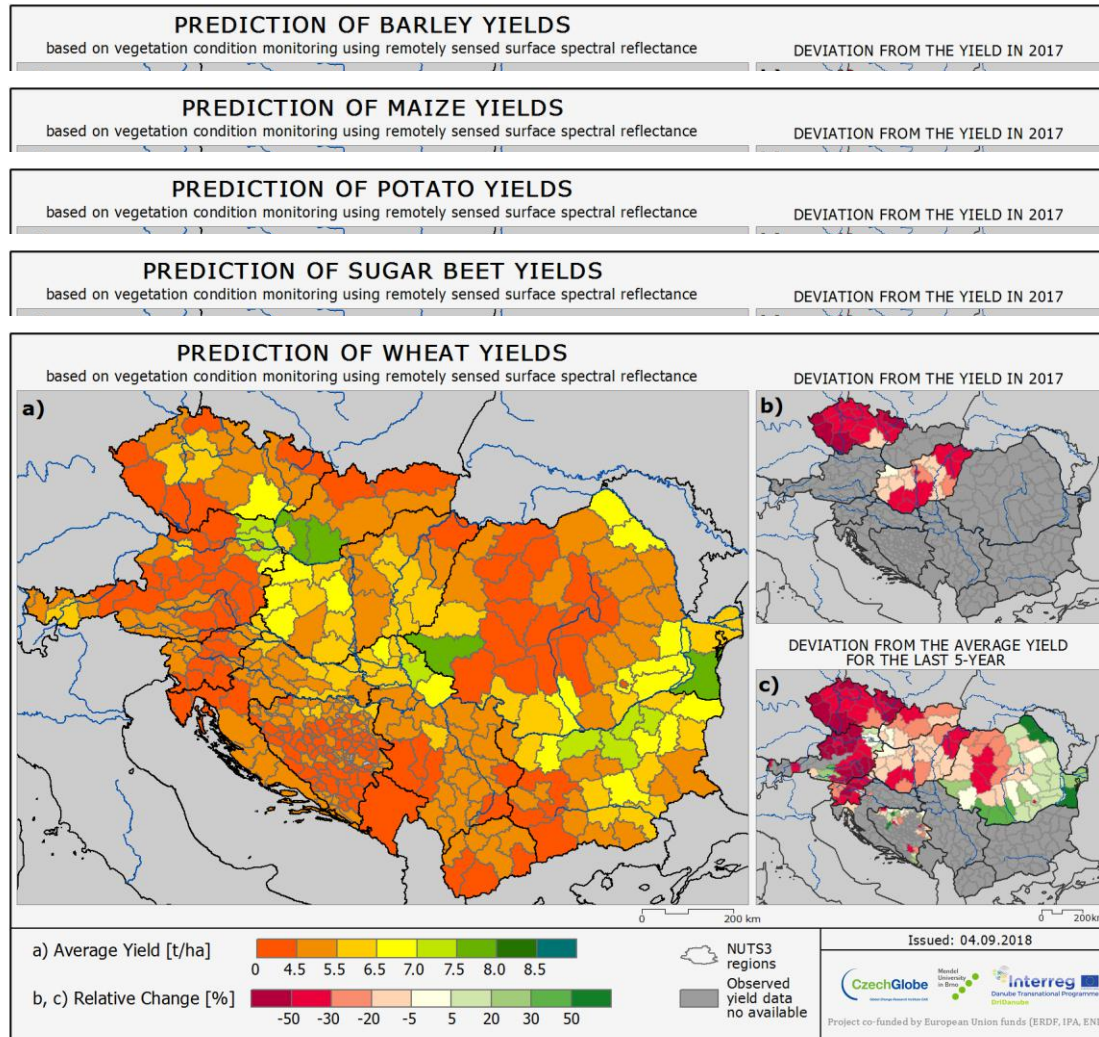
- SWI together with other products create basis for yield prediction (predictors)
- Relation between predictors and actual yield is processed by linear regressions and neural networks
- Best results of both methods are combined into final prediction

Yield prediction – national level (www.vynosyplodin.cz)



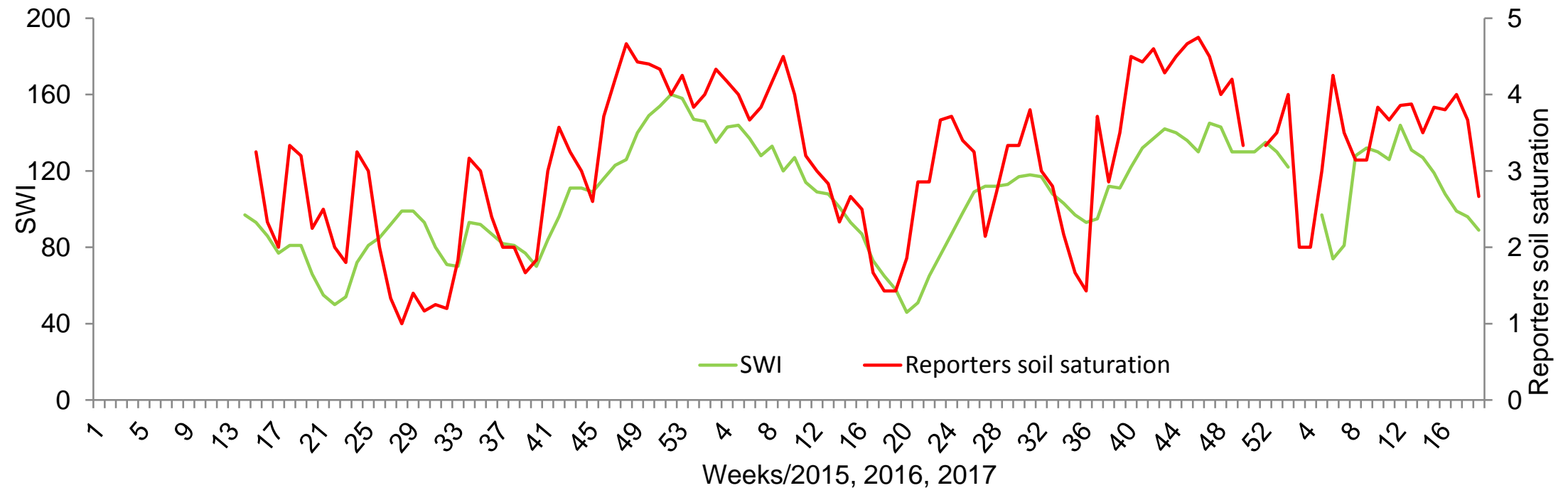
Yield prediction – Central Europe region

- Yield data collected under the umbrella of DriDanube project, from involved countries in Danube region
- NUTS3 level
- Weekly operational during the vegetation season for barley, wheat, potatoes, sugar beet and maize



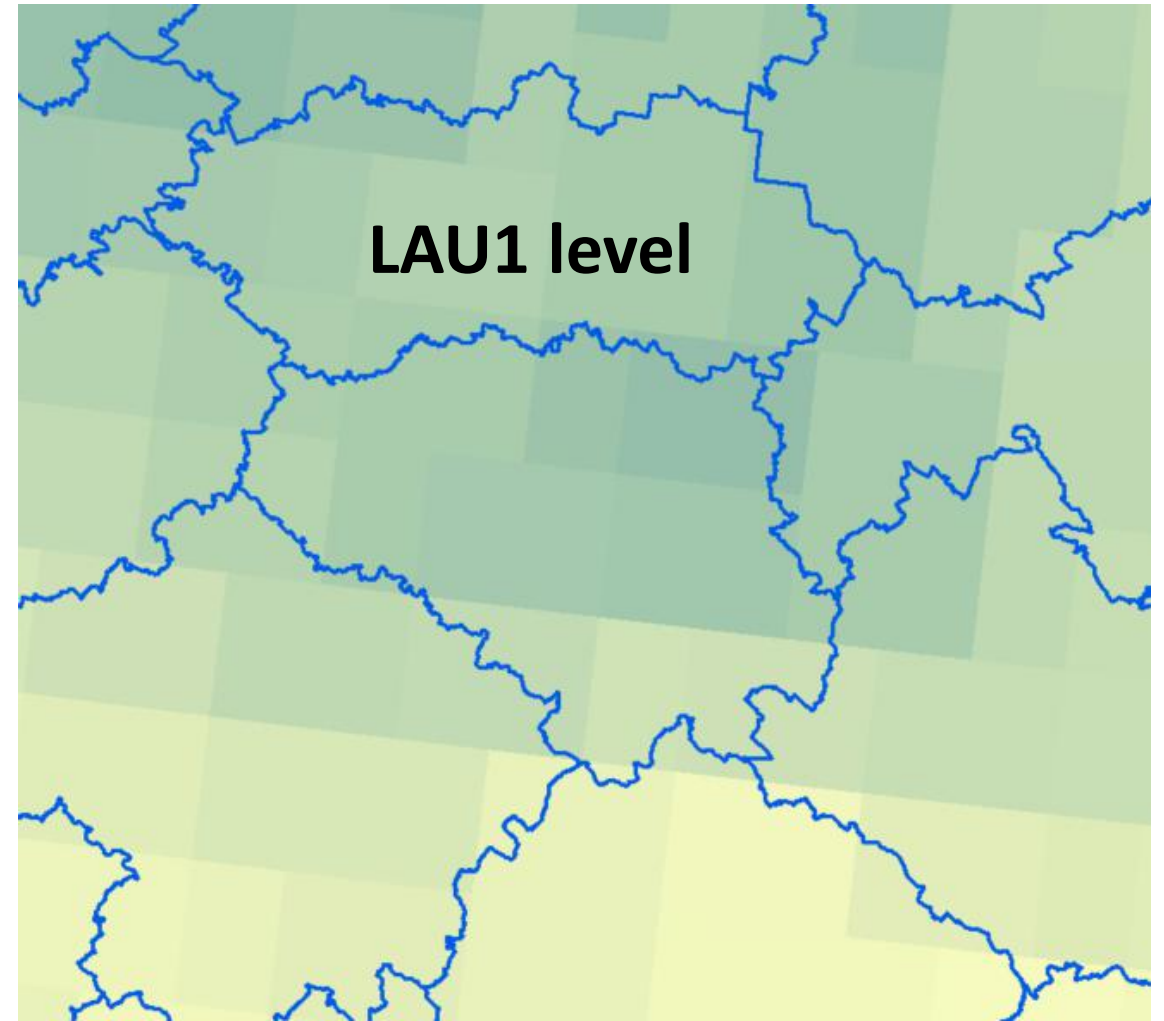
SWI – validation with reported soil moisture values

- Tested on data from 2015 – 2017
- Aggregation by LAU1
- Example for concrete region:



Summary: Conclusions and perspectives

- SWI spatial resolution limitations
- Surface soil moisture?
- Any other product recommendations?



Summary: Conclusions and perspectives

- Interest in surface albedo and land surface temperature products to replace MODIS products - Any possibilities of higher spatial resolution?
- Possible usage of Snow water equivalent and Vegetation condition index

Thank you for attention!

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