

CLIMATE SERVICES IN THE CZECH REPUBLIC

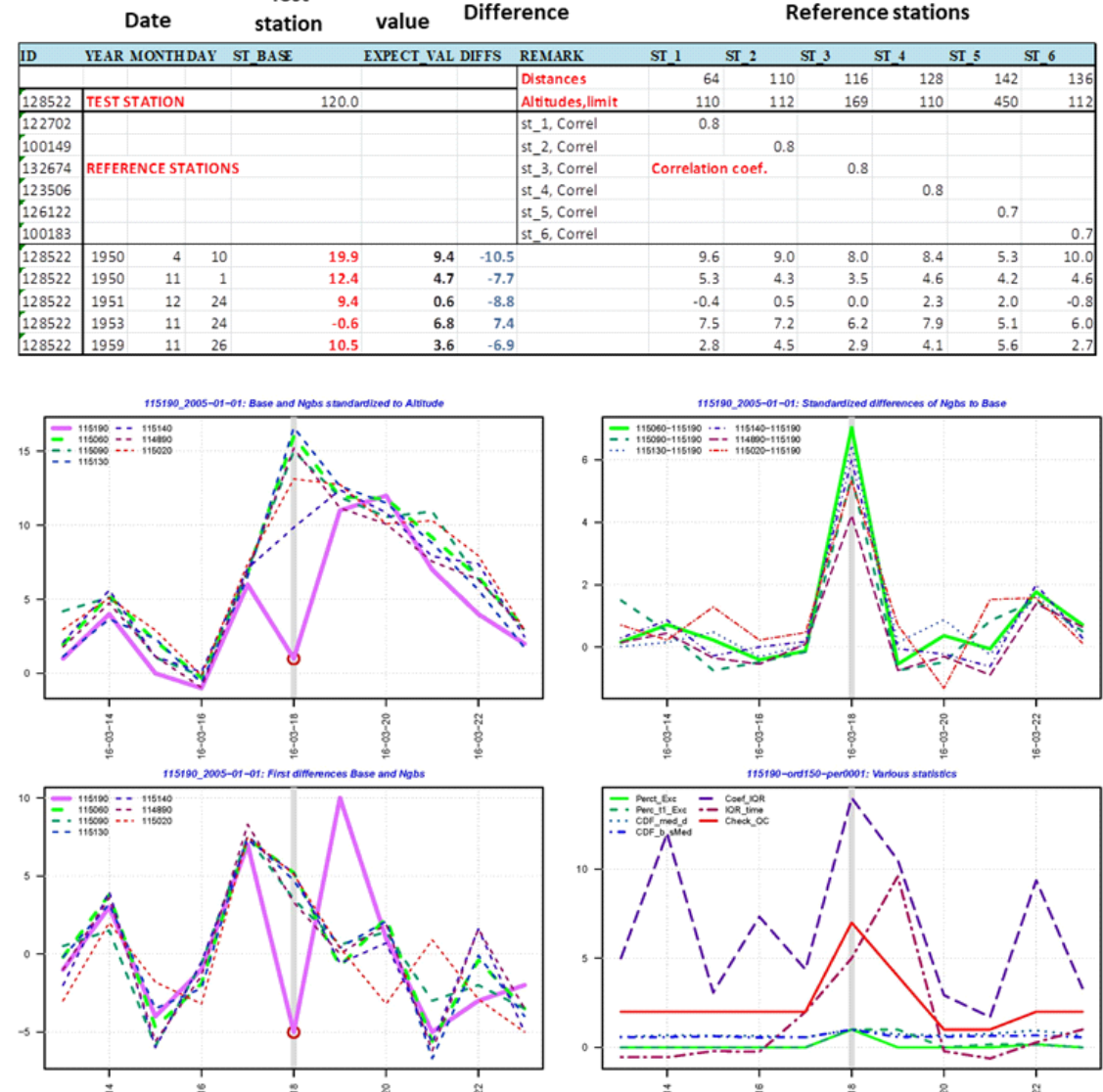
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Our mission is to provide climate information to public, state authorities, politicians and experts (free of charge). This is based on pre-processed meteorological and climatological datasets and is disseminated through special web portals.

Climatological data

Data quality control

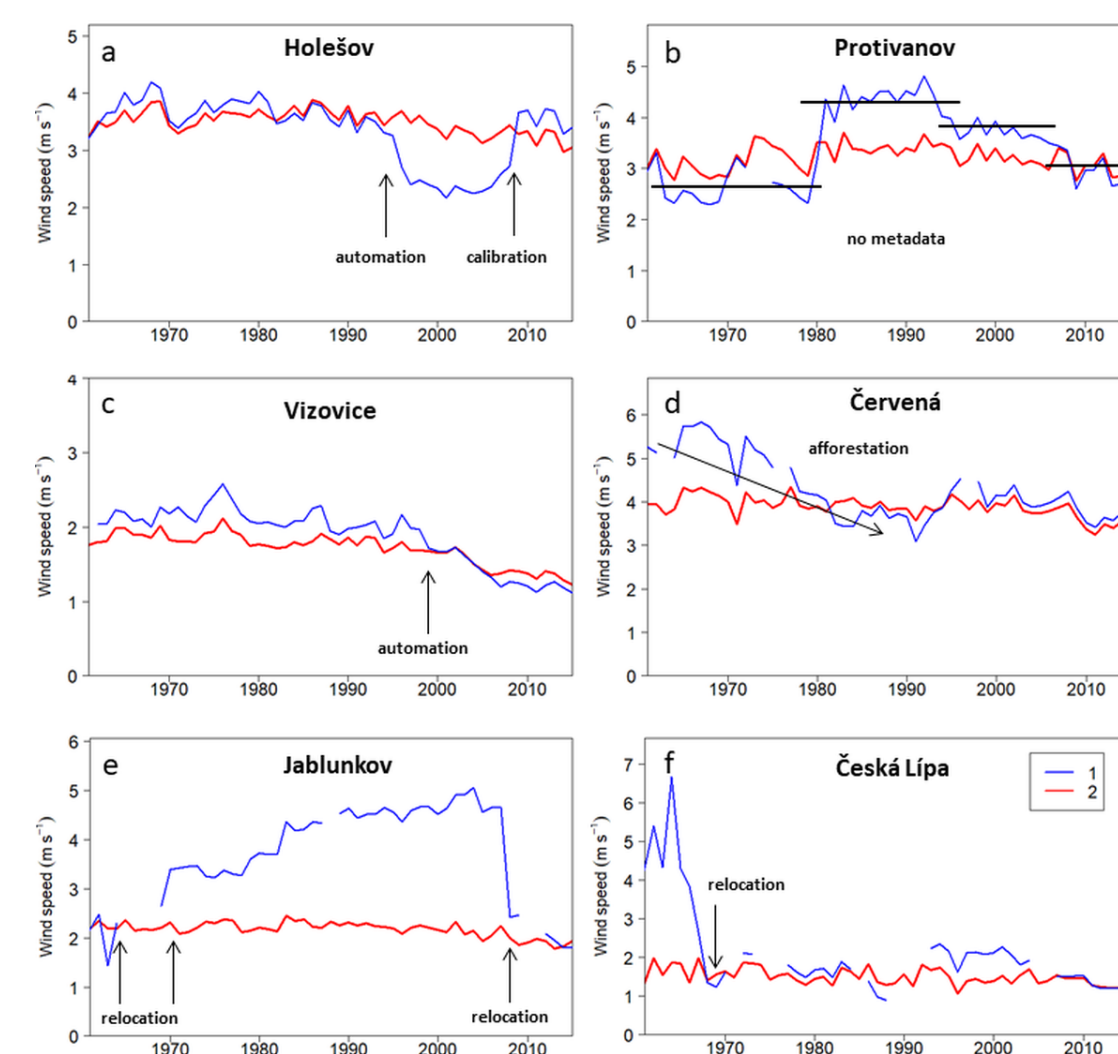
A new procedure and software (MetQC) was developed based on combination of several statistical tests. To be applied within CCC C3S.311a.Lot.4.



MetQC outputs (tables and graphs)

Time series homogenization + filling gaps

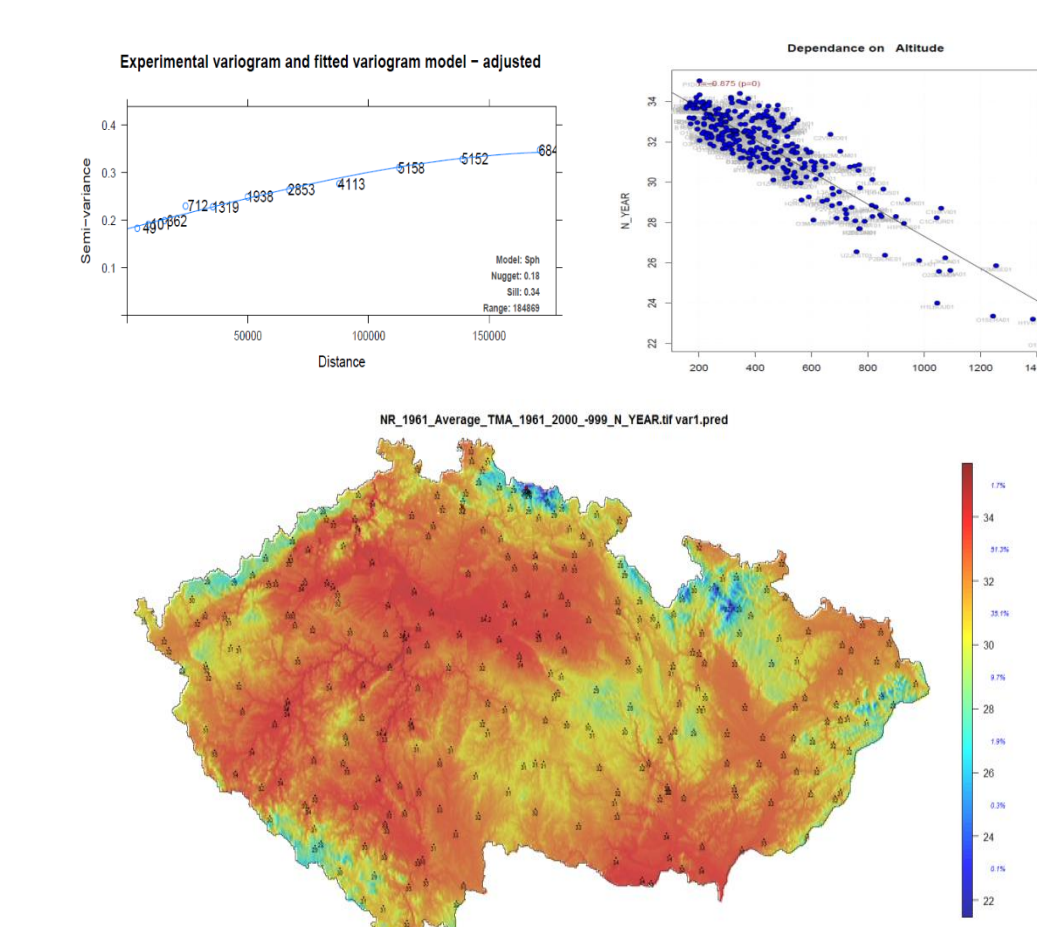
More than 20 years of experiences with various types of data (meteorological elements). Detection of inhomogeneities in monthly step is based on ensemble of methods. Daily step correction is based on own DAP method (Distribute Adjust by Percentile) Finally, missing values in the period 1961-2022 are being filled.



Comparison of homogenized and raw time series of wind speed at selected meteorological stations.

Spatial interpolation

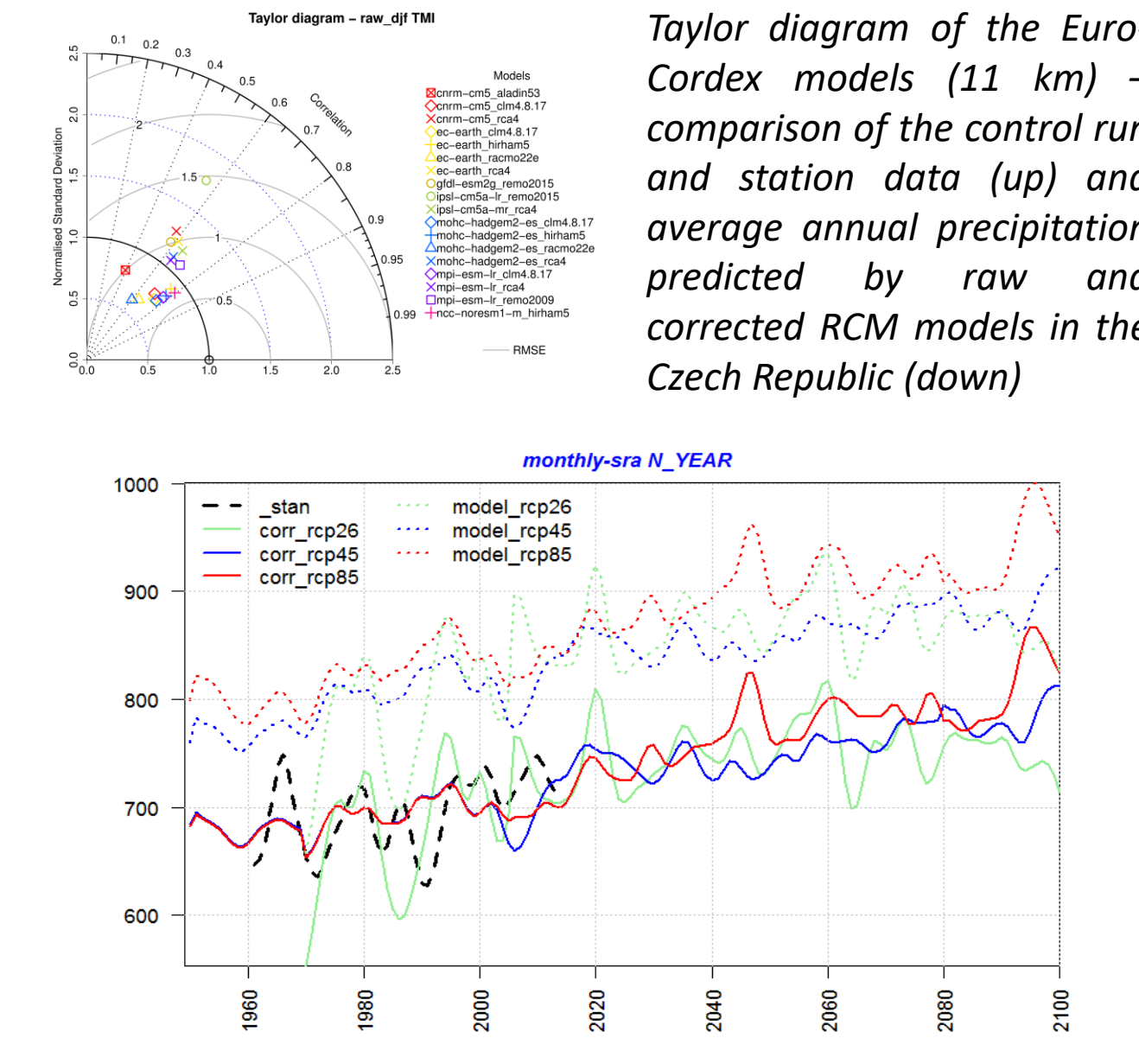
The pre-processed station records of various meteorological elements are spatially interpolated into a 500x500 m resolution and these layers are then applied in various products (it includes hourly, daily to the long-term averaged data). Our method is based on regression kriging.



Example of the own interpolation methods outputs (semivariogram; dependence of the interpolated values on the one of predictors and automatic maps)

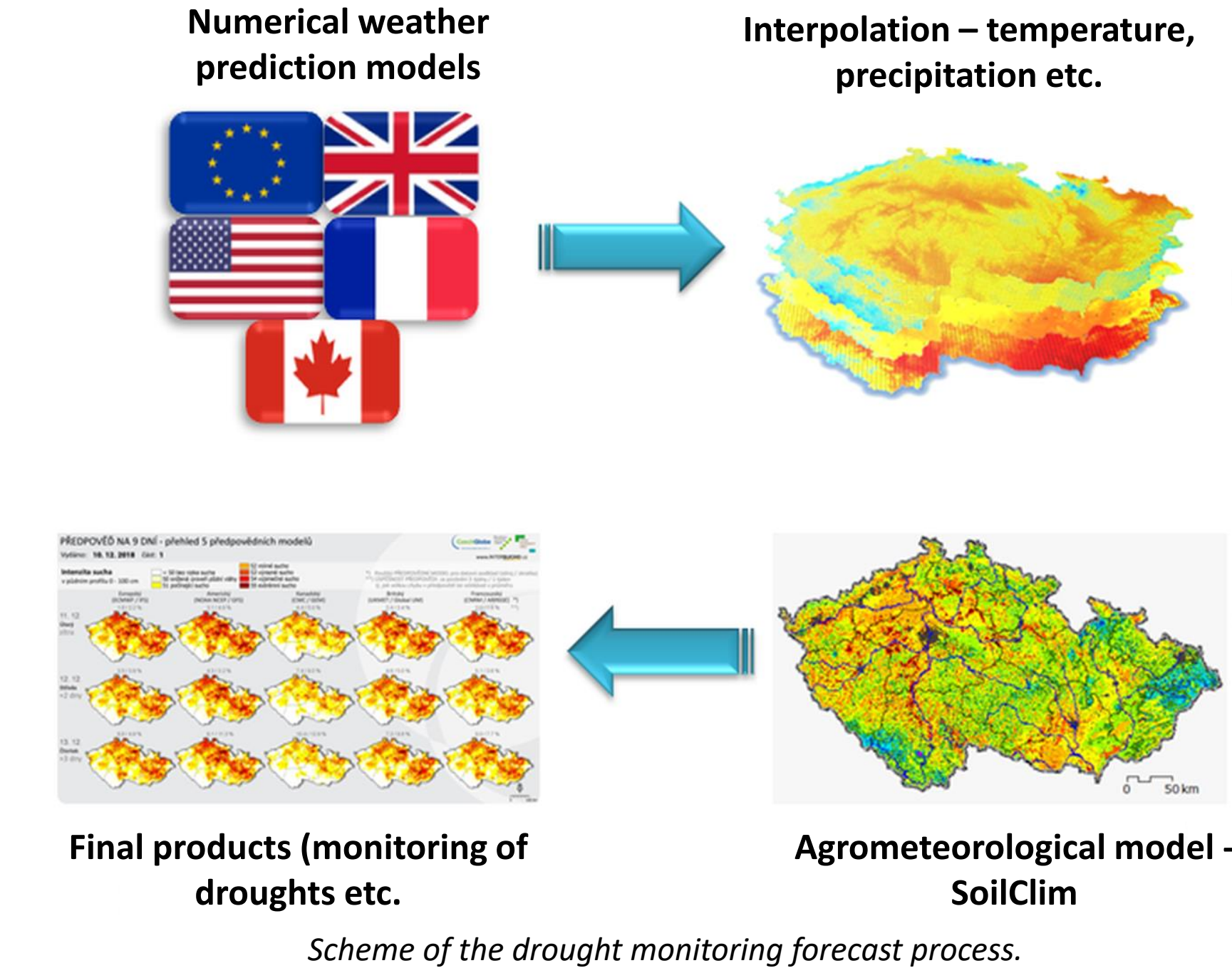
Climate models

Models (GCM, RCM) were selected, that capture climate in Central Europe well. These were further bias corrected and recalculated to the location of meteorological stations.

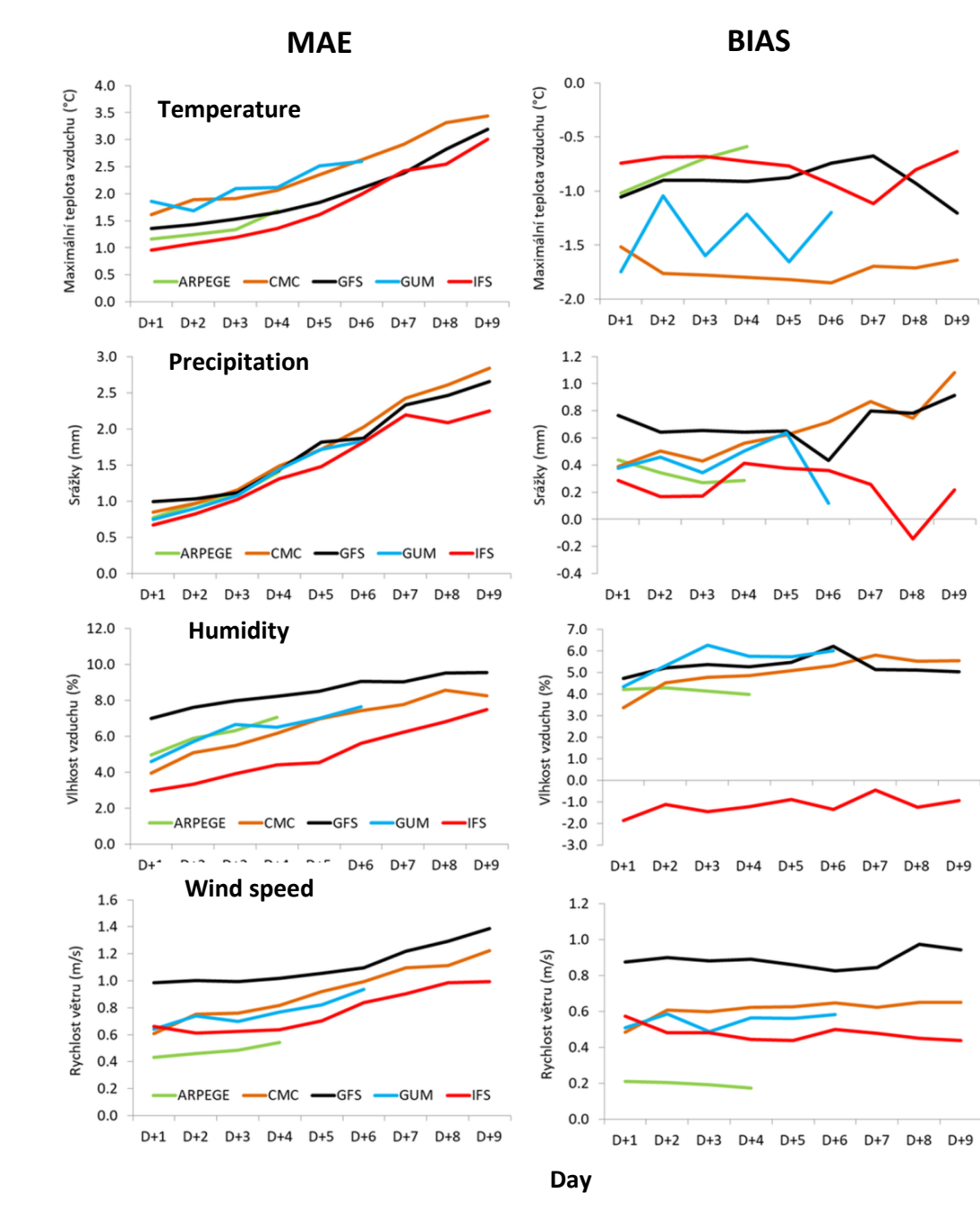


Forecast data

There is great uncertainty in the weather forecast, so you cannot rely on just one model. Our forecast is based on a set of multiple models. This better captures the uncertainty.



www.agrorisk.cz



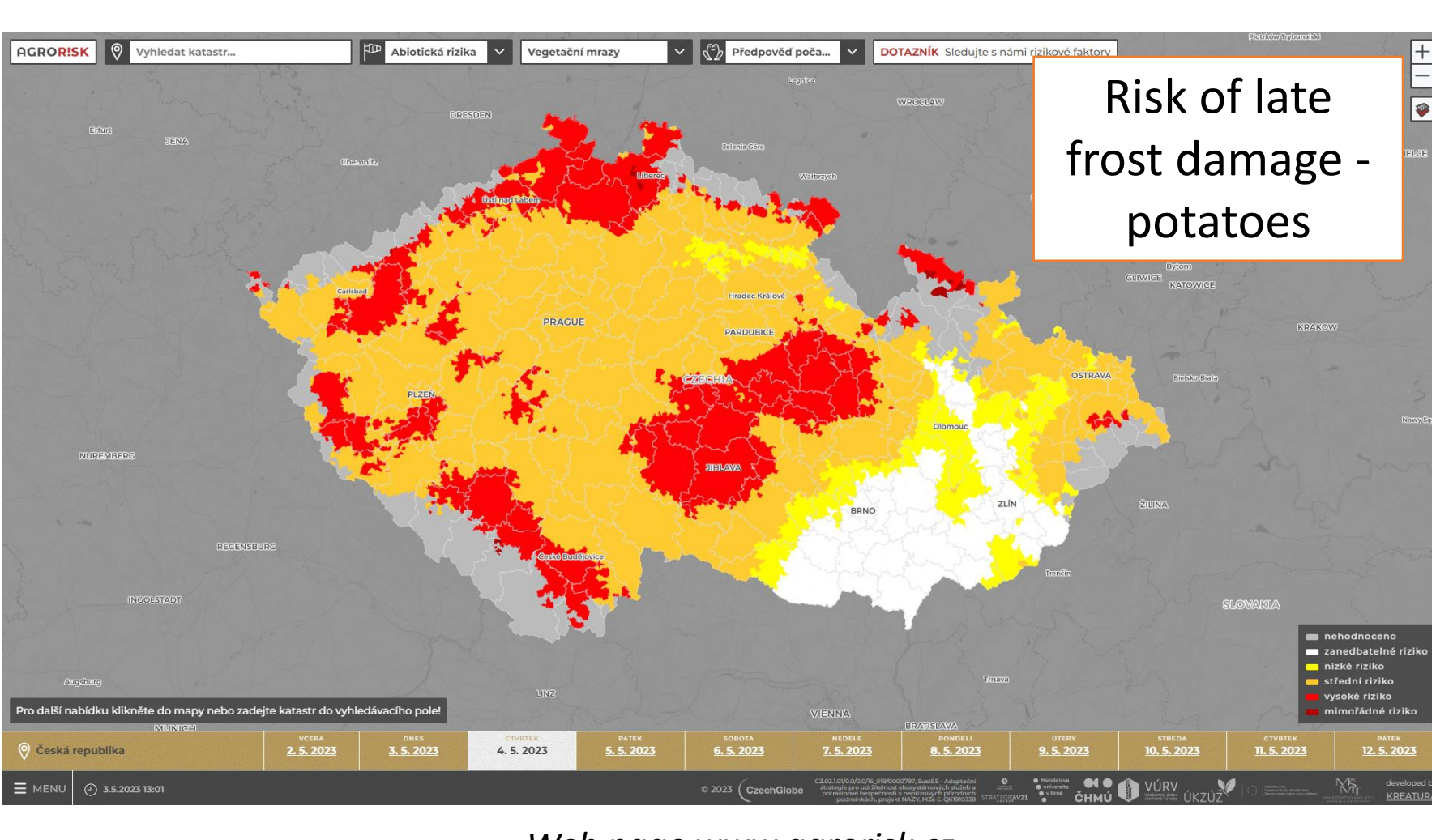
Validation of the forecast by various numerical weather prediction models in the Czech Republic

Climate change web portal www.klimatickazmena.cz

Home web page www.klimatickazmena.cz

Example of the free downloadable layouts and infographics

The newly prepared portal is focused on monitoring and forecasting of selected biotic and abiotic noxious factors. This also includes early warning of late spring frosts, strong winds, high temperatures, drought or occurrence of pests and diseases.



Monitoring of drought www.intersucho.cz

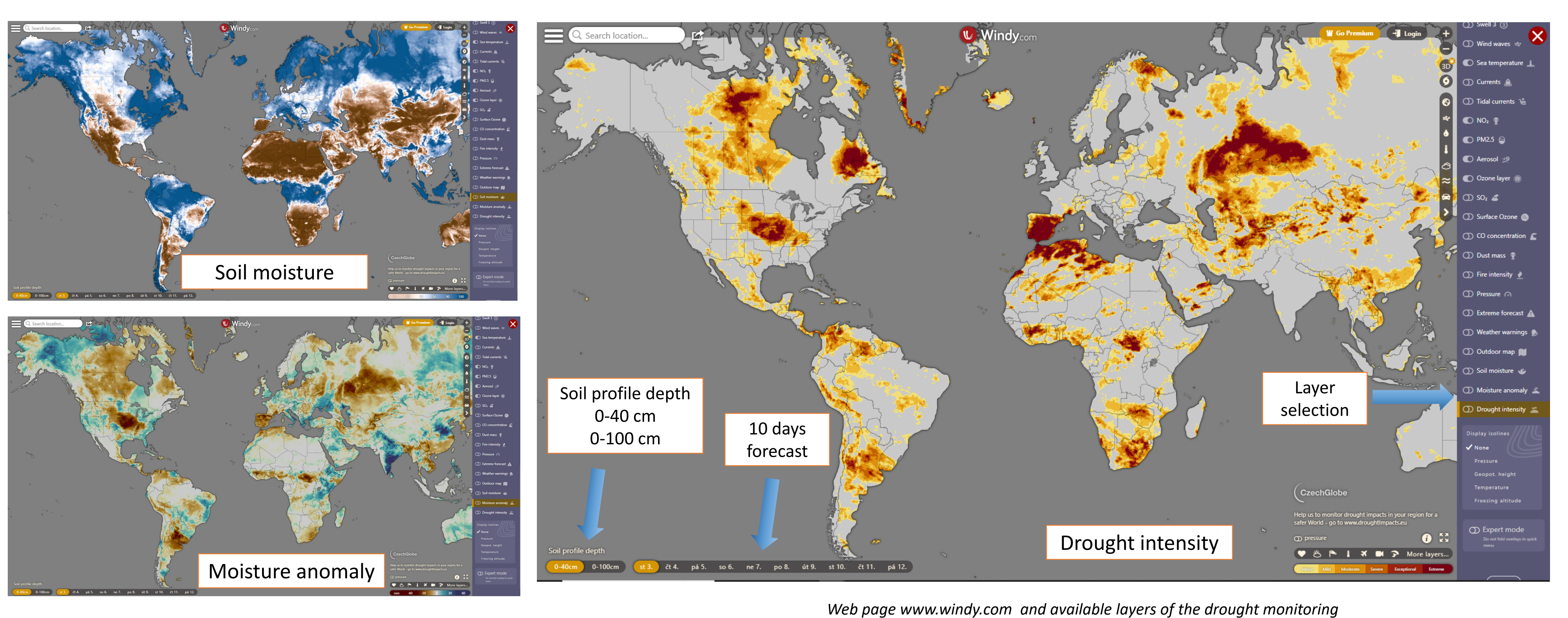
The flag ship is a drought monitoring system that focuses on monitoring of agricultural drought and its forecast for 10 days ahead by numerical weather prediction models.

It is based on several pillars, such as measured data, satellites and feedback from farmers. In return, a localized forecast is provided for them free of charge.

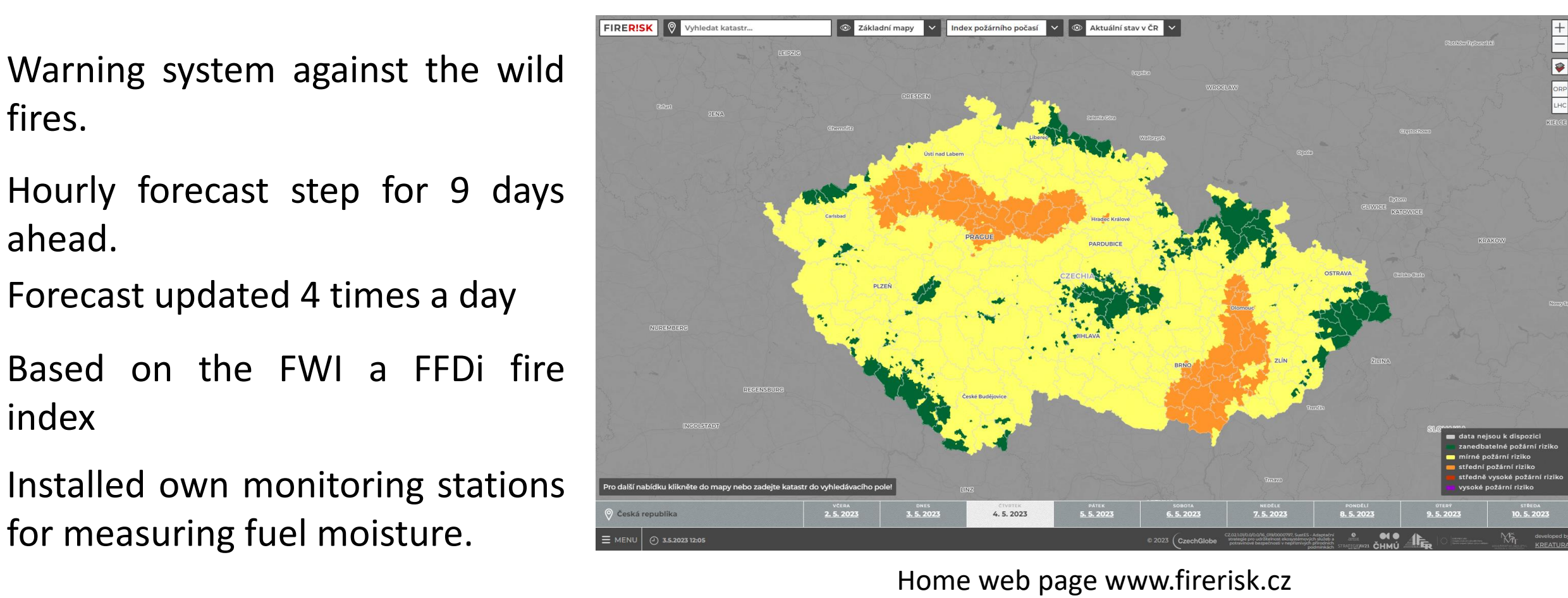


Global Drought Monitoring System (www.windy.com)

Drought monitoring and forecasting for the entire world. They combined the know-how of the operators of the Intersucho.cz website and the ability of the Windy.com developers to display meteorological data that appeals to millions of users daily. A tool has been created that allows you to monitor the intensity of the drought in real time and predict the development for the next 10 days. ERA5 Land is used as historical data and numerical weather prediction model ECMWF IFS is used as forecast data. The system is updated daily.



www.firerisk.cz



Conclusions

- We developed own quality control software (MetQC) and tools for the homogenization, bias correction and interpolations (ProClimDB, www.climahom.eu)
- The created quality controlled and homogenized data serve in various products as bases for tuning statistical models that are core of these products and thus help to make the products as best as possible
- Examples of products based on pre-process climatological data shown here included drought monitoring, specific products for farmers and climate change
- We put science into practice

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