

New Map Products in Climatological Services on the Webpage of the Slovak Hydrometeorological Institute

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New gridded climatological maps

Innovations in the processing of climatological data have led to the introduction of new daily climatological map products on the website of the Slovak Hydrometeorological Institute (www.shmu.sk). The new maps display average, maximum, and minimum air temperature, daily totals of atmospheric precipitation, and potential evapotranspiration with a horizontal resolution of 1 km. These new gridded climatological maps were introduced into operation in March 2025. The products are computed on a daily basis using a high-performance computer (HPC) and are available around 9:00 UTC. Temperature maps are created using the method of Frei (2014), which is suitable for areas with complex orography, as it was originally developed for the territories of Switzerland and Austria. The precipitation map is produced using a two-step interpolation procedure, combining monthly normal precipitation fields created by kriging with external drift (KED) and a daily field generated using the Inverse Distance Weighting (IDW) method. The daily sum of potential evapotranspiration is derived from these maps using the Hargreaves method (Hargreaves & Samani, 1982).

Fig. 1: Demonstration of gridded minimum daily air temperature during temperature inversion in December 2025

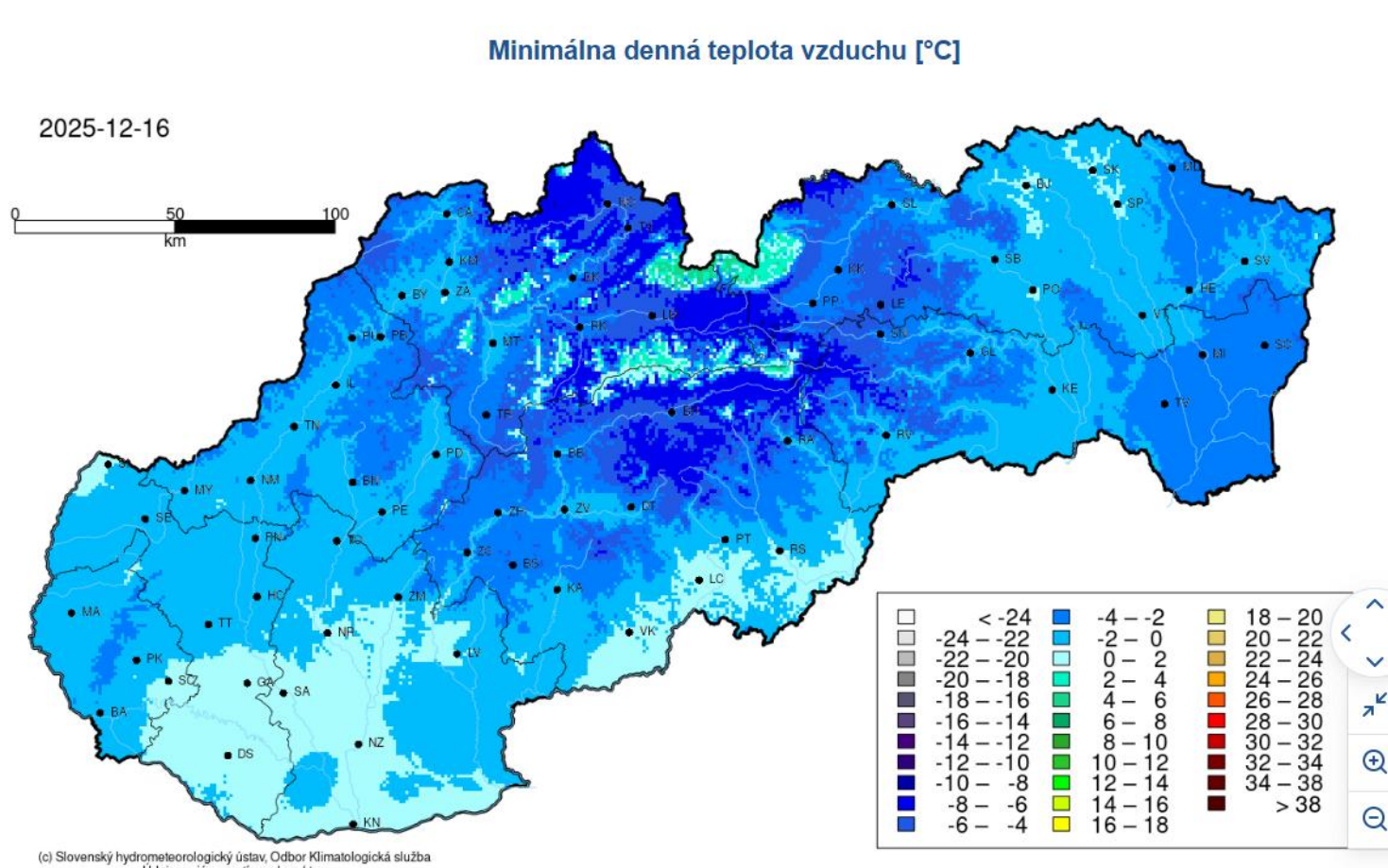


Fig. 2: Gridded daily precipitation sum

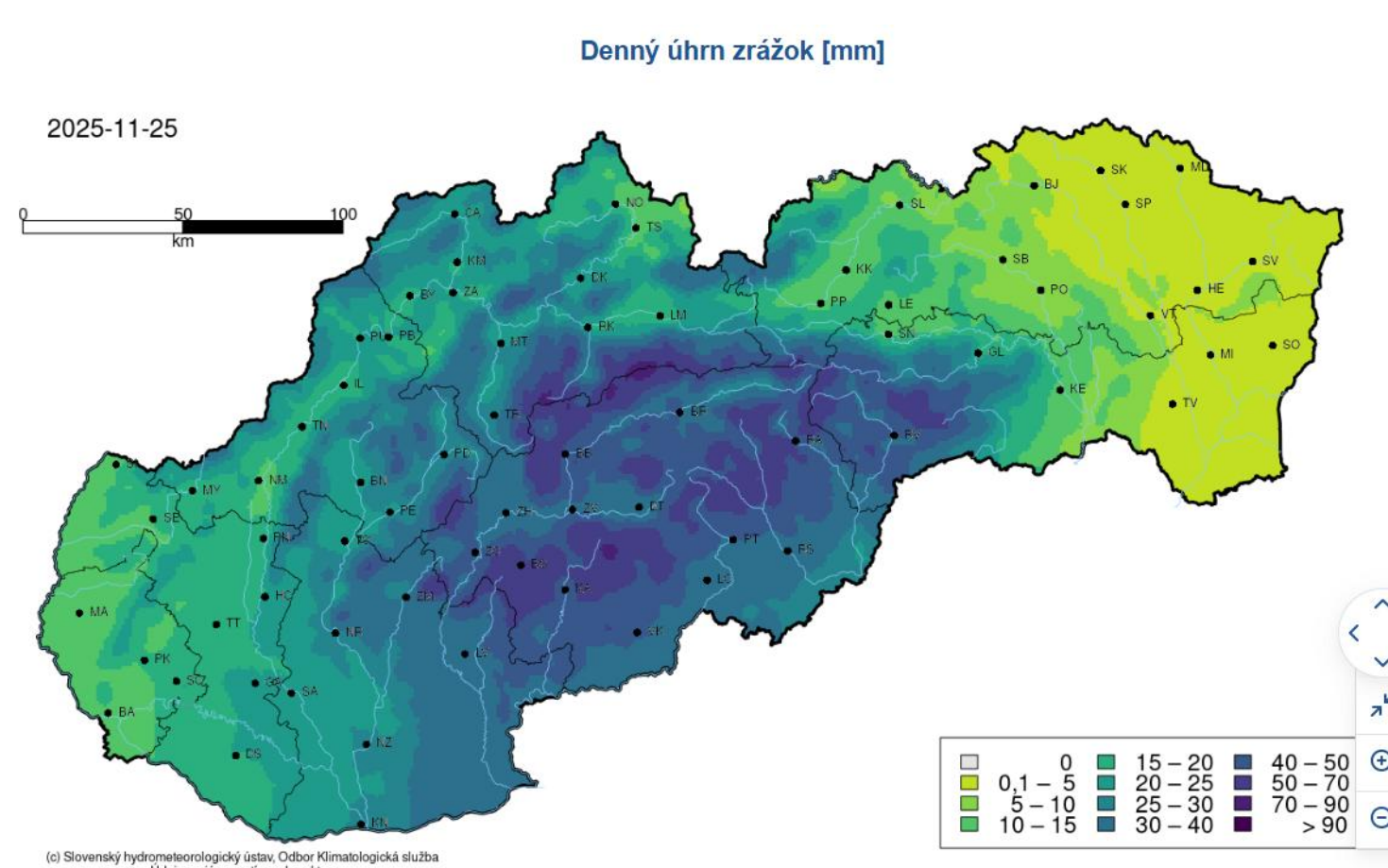
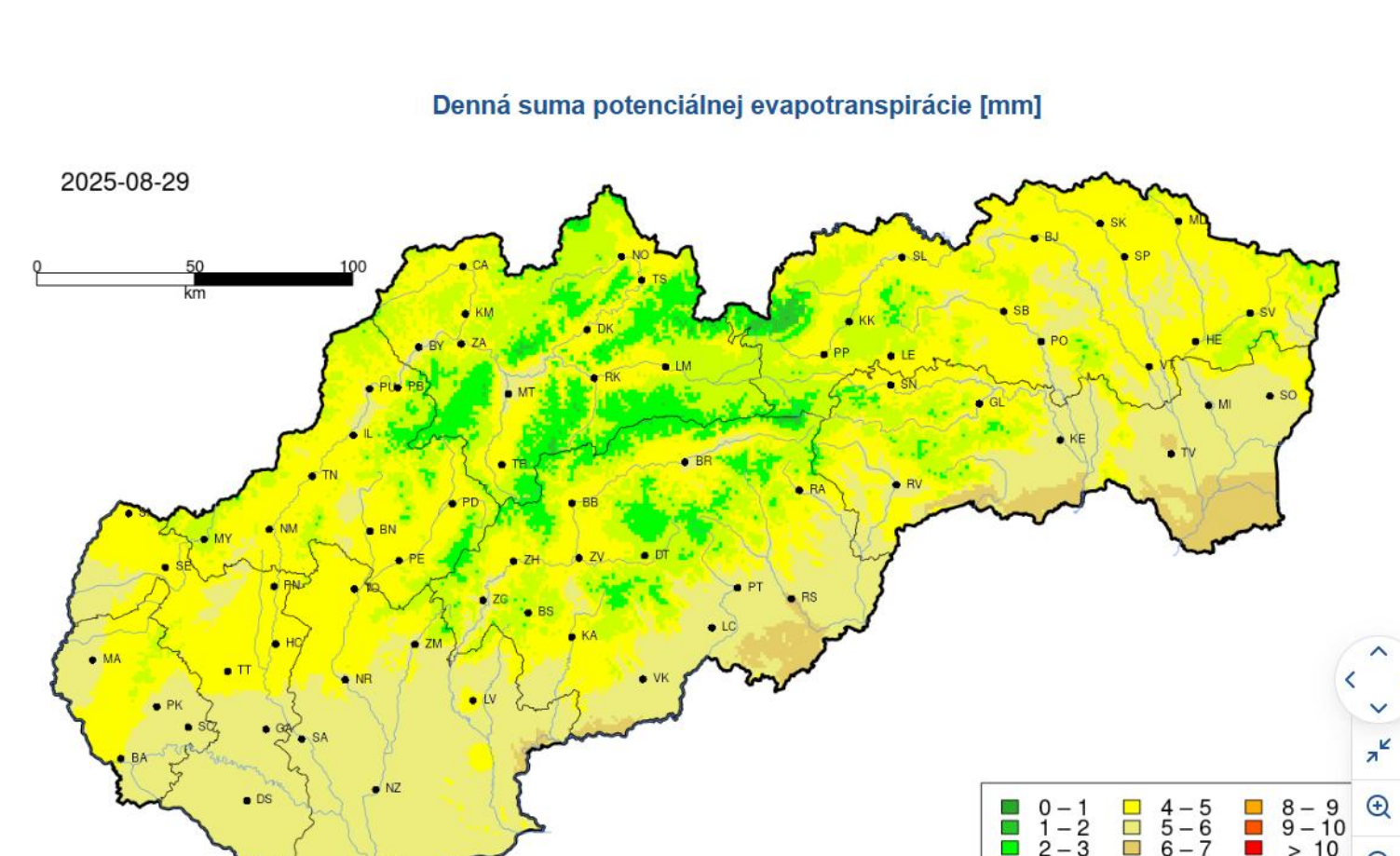


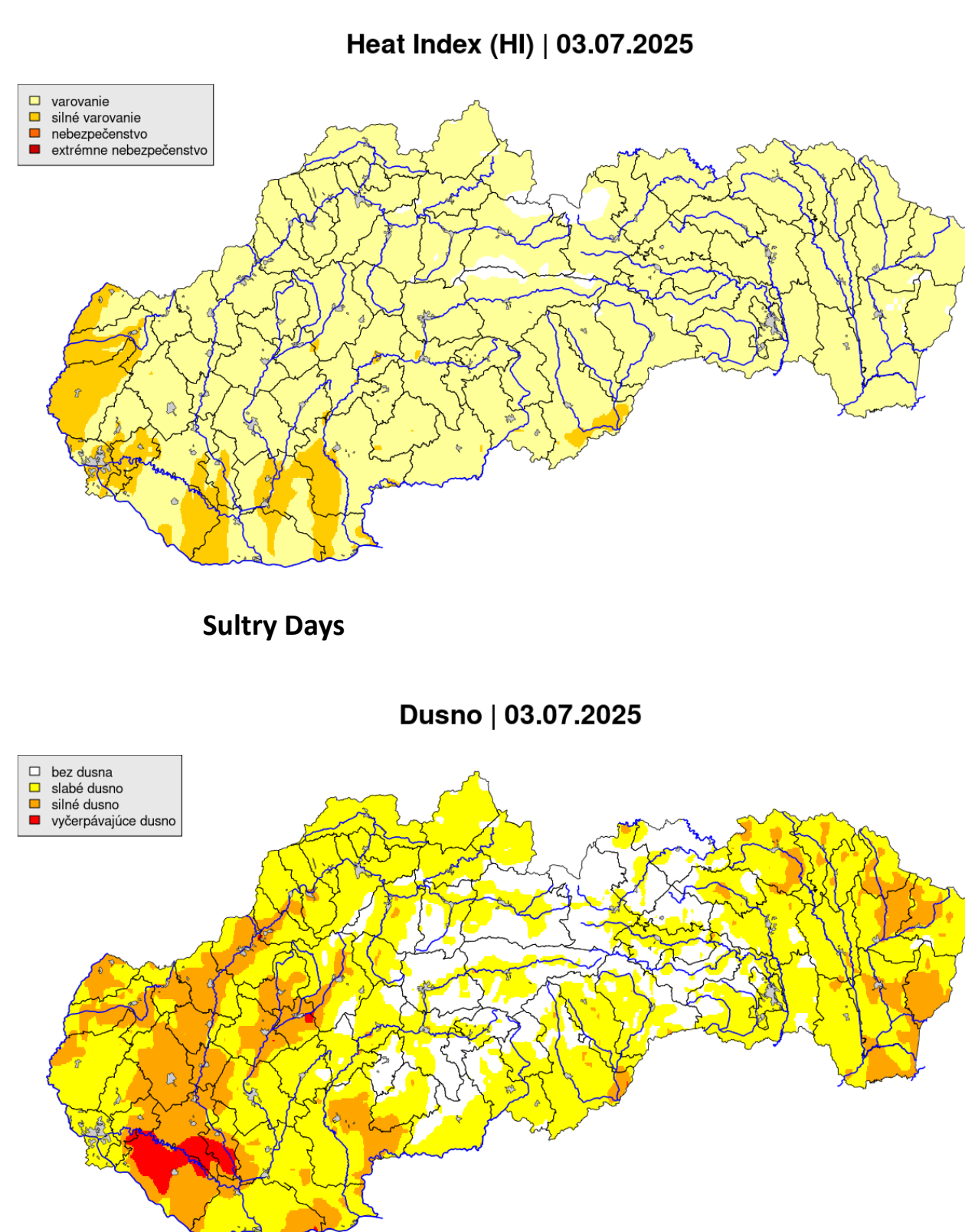
Fig. 3: Daily sum of potential evapotranspiration during a tropical day in August 2025



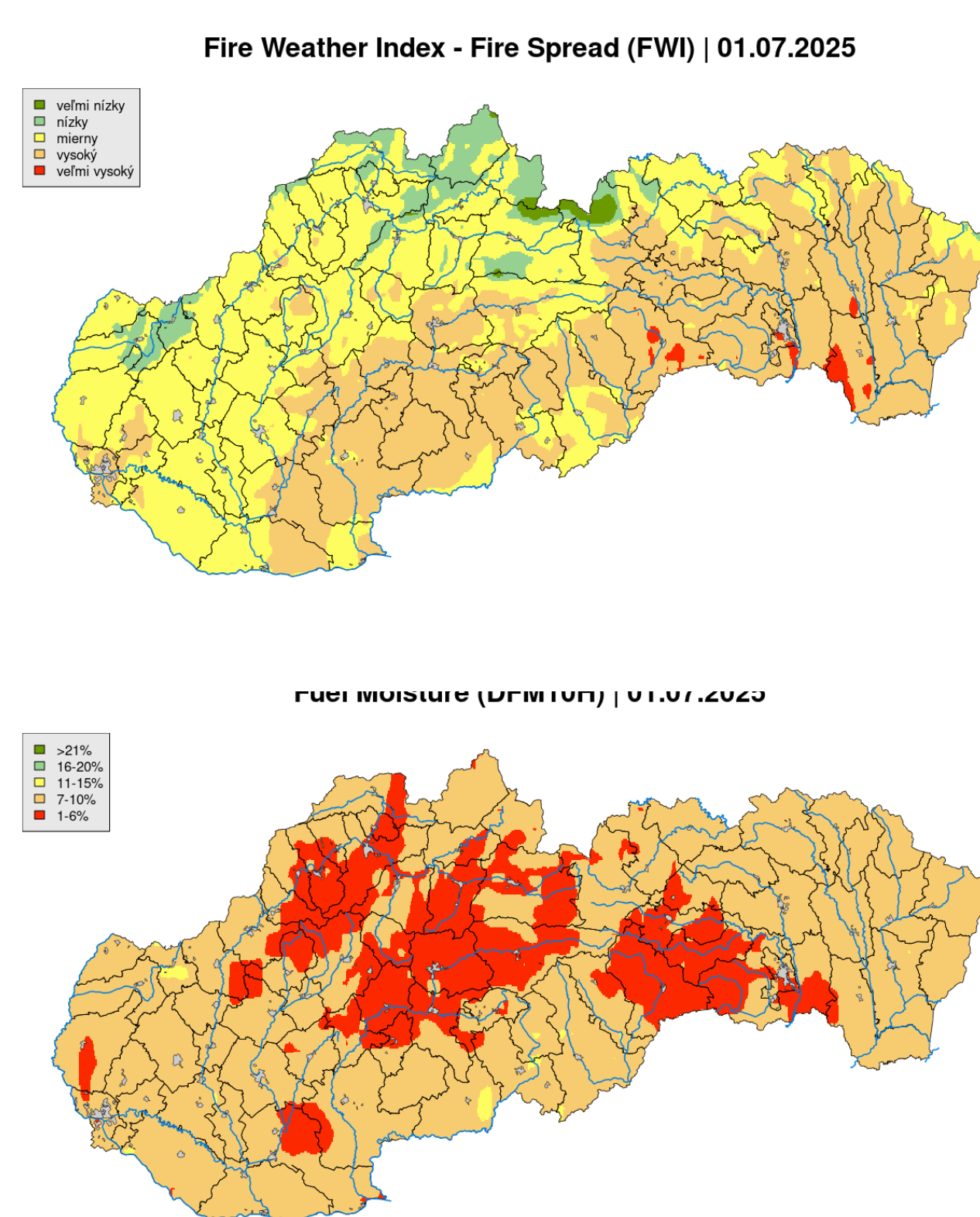
New bioclimatological and fire risk maps

Bioclimatological and fire risk indicators are available in the Fire Risk Indices and Bioclimatological Products tabs. Bioclimatological products comprise the Universal Thermal Climate Index (UTCI), Heat Index (HI), and a map of sultry days. Fire risk products include the Fire Weather Index (FWI) and fuel moisture content (FMI) for 1-2.5 cm fuels. All products provide a 7-day forecast based on the ALADIN model (2 km resolution, days 1-3) and the ECMWF model (days 4-7).

Figs. 4-6: HI, UTCI and Sultry Days based on ECMWF model during tropical day in July 2025



Figs. 7-8: FWI and Fuel Moisture based on ECMWF model during tropical day in July 2025



New gridded drought monitoring maps

Drought monitoring products were introduced in June 2025 with a new interface based on 1 km raster maps, replacing the previous station-based approach and improving spatial detail. The system includes key indicators: SPEI and SPI (30-day), precipitation balance and percentage relative to the 90-day normal, and drought duration. Selected indicators offer interactive graphs (60-day history + 7-day forecast). Forecasts are ensemble-based, using A-LAEF (days 1-3) and ECMWF (days 4-7), showing the mean and 10th/90th percentiles to represent uncertainty.

Figs. 9-12: SPEI (left side) and SPI (in the middle) indices and precipitation balance (right side) showing variability of meteorological drought across Slovakia in July 2025, below the graphs with SPEI and SPI history and ensemble forecast for town Levice

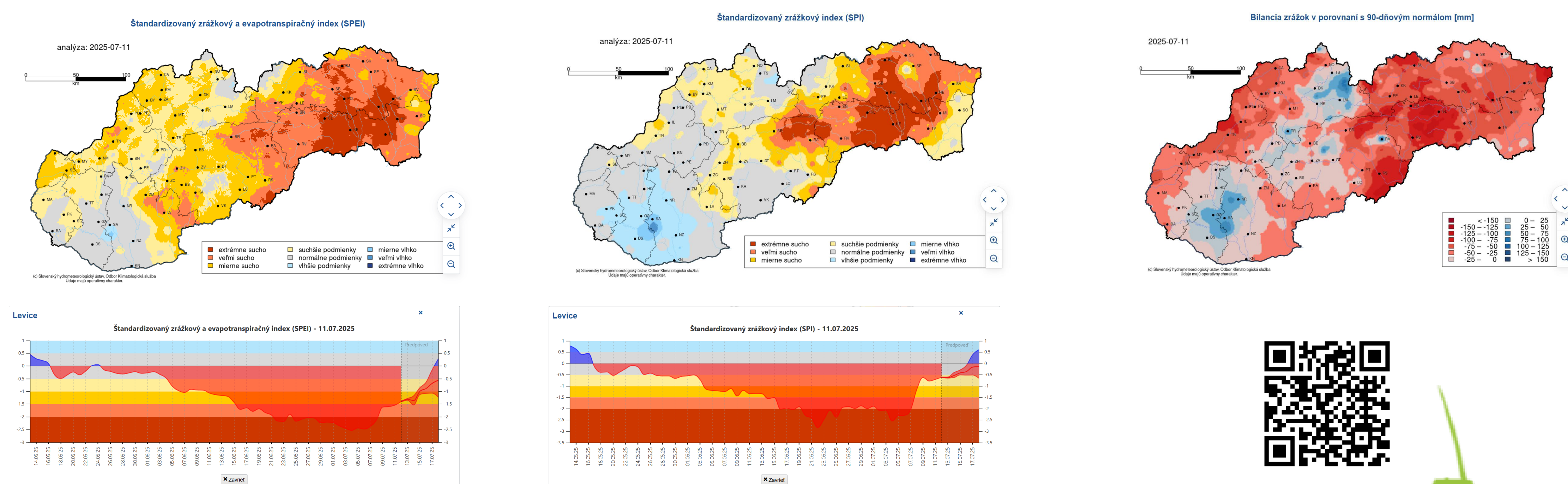


Fig. 13: Ensemble forecast showing uncertainty in SPI forecast

