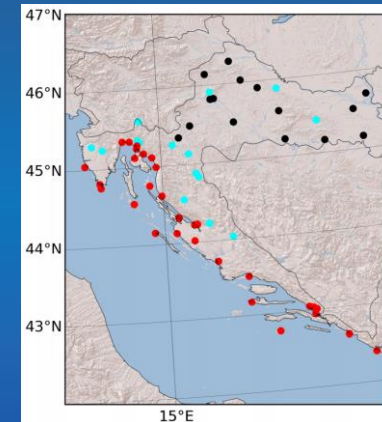


Evaluation of analog-based post-processing in Croatia for the wind gust NWP

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- Master's thesis of Ivan Vujec (Vujec 2020), mentorship by Iris Odak Plenković
- NWP forecast correction with analog-based post-processing on locations where the measurements are available
- Analog method forecasts based on Delle Monache et al. 2011
- 3 variations:
 1. regular analog method forecast **AnEn**,
 2. the variation with weight optimization **AnEnT**, and
 3. the variation with additional correction for high wind gusts **AnEnK**
- Measurements: 61 locations across the Republic of Croatia, hourly measurements of wind gusts (VMAX), 3 groups of stations
- NWP: ALADIN with a horizontal resolution of 4 km, 1-h lead-time interval, up to 72 h



- Verification approach:**

- wind gusts as a continuous variable (RMSE decomposition by lead-time, month, overall)
- wind gusts as a categorical variable (analysis of non-extreme (ETS, Fbias, and ROC curves) and extreme (EDI and frequency) events, summary measures (PCC and SEEPS)

- Results:**

- Analog method almost always shows superiority to ALADIN model;
- ALADIN model does not distinguish the type of terrain as well as the analog method;
- All forecasts better model the bora than the sirocco wind, but relative improvement over NWP is better for the sirocco wind;
- AnEnK is usually the best variation, but the differences are small

- Related publications:**

- Delle Monache, Luca, Thomas Nipen, Yubao Liu, Gregory Roux, and Roland Stull. "Kalman Filter and Analog Schemes to Postprocess Numerical Weather Predictions." *Monthly Weather Review* 139, 11, 2011: 3554-3570
- Odak Plenković, Iris, Irene Schicker, Markus Dabernig, Kristian Horvath, and Endi Keresturi. "Analog-based post-processing of the ALADIN-LAEF ensemble predictions in complex terrain." *Quarterly Journal of the Royal Meteorological Society*, 146, 2020: 1842– 1860.
- Odak Plenković, Iris, Luca Delle Monache, Kristian Horvath, and Mario Hrastinski. "Deterministic Wind Speed Predictions with Analog-Based Methods over Complex Topography." *Journal of applied meteorology and climatology*, 57, 2018: 2047-2070
- Vujec, Ivan. "Evaluacija naknadne obrade prognoze numeričkog modela", Master's thesis, Faculty of Science, University of Zagreb, 2020

