Development of operational waterspout forecast product for Adriatic Sea using ALADIN NWP model.

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Maritime transport and traffic is a significant branch of Adriatic Sea area's economy, especially during summer season due to increased nautical tourism. Forecasting potentially dangerous meteorological events and issuing warnings is one of the main tasks for Croatian marine forecasters. Although waterspout events are globally recognized as a marine hazard, the standard operating procedure for issuing waterspout event warnings in Croatia does not exist, nor does the adequate operational product for forecasters. Recently, several efforts were made to test numerical weather prediction (NWP) models performance for waterspout events forecasting. In this study further effort is made using ALADIN NWP model to test and validate an operational product for waterspout event forecast, based on the Szilagyi Waterspout Index (SWI). Lifting parcel method is used to determine lifted condensation level (LCL) and equilibrium level (EL), which combined with surface and 850 hPa level temperature difference are used to calculate SWI. Three operational versions of ALADIN model were used for SWI calculation: ALADIN-HR8, ALADIN-HR4 and ALADIN-HR2. Main differences between the versions are different horizontal grid spacing (8, 4 and 2 km respectively), different vertical resolution (HR8 and HR2 - 37 vs. HR4 - 73 levels) as well as some physical parametrisation options. Results presented in this study are used to develop and improve the operational product for waterspout event forecast at Adriatic Sea area.