

In this paper, the impact analysis of different high-resolution and time-varying sea surface temperature (SST) datasets on the rainfall-runoff system during catastrophic flood events that occurred in sub-basins located in the Mediterranean (MED) and Eastern Black Sea (EBS) regions is carried out. The application of the state-of-art WRF/WRF-Hydro hydrometeorological modeling system coupled in one-way mode is performed to simulate the flood events over the study areas by utilizing physically-based, fully-distributed, and multi-scale features of the model. The findings of this study show that using high-resolution SST datasets in initial and lower boundary conditions creates a better representation of the precipitation and hydrograph simulations of selected flood events in topographically complex small catchments of MED and EBS regions.