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# Improving the snowmelt modelling in mesoscale Hydrological Model (mHM) with satellite based dynamically calculated degree-day factor

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Modelling snow events stayed as challenge as it depends on multiple parameters. For the sake of performance and fewer requirements, temperature-index models employed. These models generally calibrate a basin-wide threshold temperature, a degree-day factor (DDF) which accepted as constant. Some hydrologic models such as Mesoscale Hydrologic Model (mHM), that employs multiscale parameter regionalization approach (MPR) to model sub-grid variability, improves DDF calibration spatially, based on land cover, yet temporal changes remained ignored. In this study, daily DDFs calculated using 500 m2 resolution MODIS snow-covered area product (MOD10A1) and snow depth measurements. Snow density calculated in days of accumulation and using this value DDFs are calculated in days of ablation. mHM is fed with daily DDF values and simulations done on two mountain basins in Turkey: small-scale Karanlikdere basin (area: ˜29.1 km2 and elevation range: 1295 - 2332m) and mesoscale Bahcelik basin (area: ˜2378.6 km2 and elevation range: 1497 - 2705m). Preliminary results indicate that remotely-sensed data improves model performance: discharge estimations at gauging points are slightly improved while snow-water-equivalent calculations became more realistic. For Karanlikdere Basin, mHM-calibrated DDF (2.395) converges to mean daily dynamic DDF (2.431) and NSE for the discharge simulation improved from 0.45078 to 0,45785.

## Which session would you like to present in?

1. Remote sensing, hydrological modelling and data assimilation

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