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Supplement of

Modeling snowpack dynamics and surface energy budget in boreal and subarctic peatlands and forests

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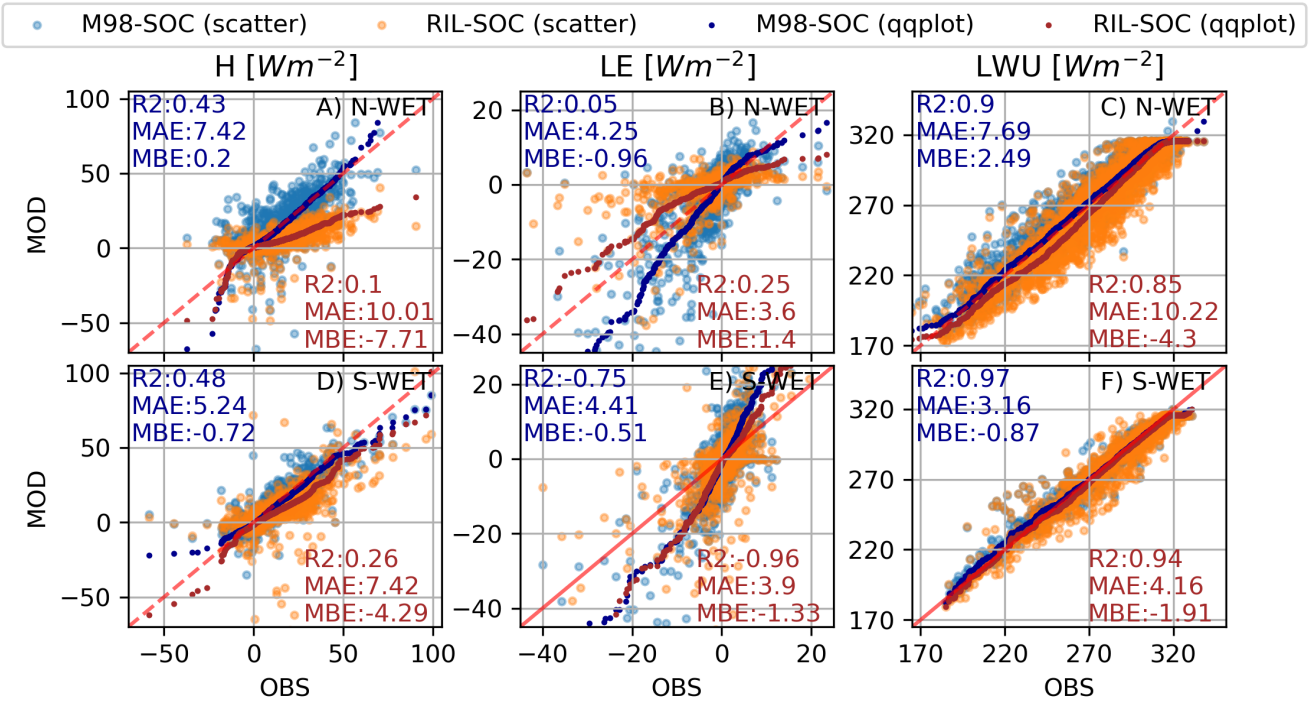

Figure S1. Scatterplots and quantile-quantile plots of surface heat fluxes during snow cover for the evaluation period with RIL-SOC and M98-SOC turbulence parameterizations.

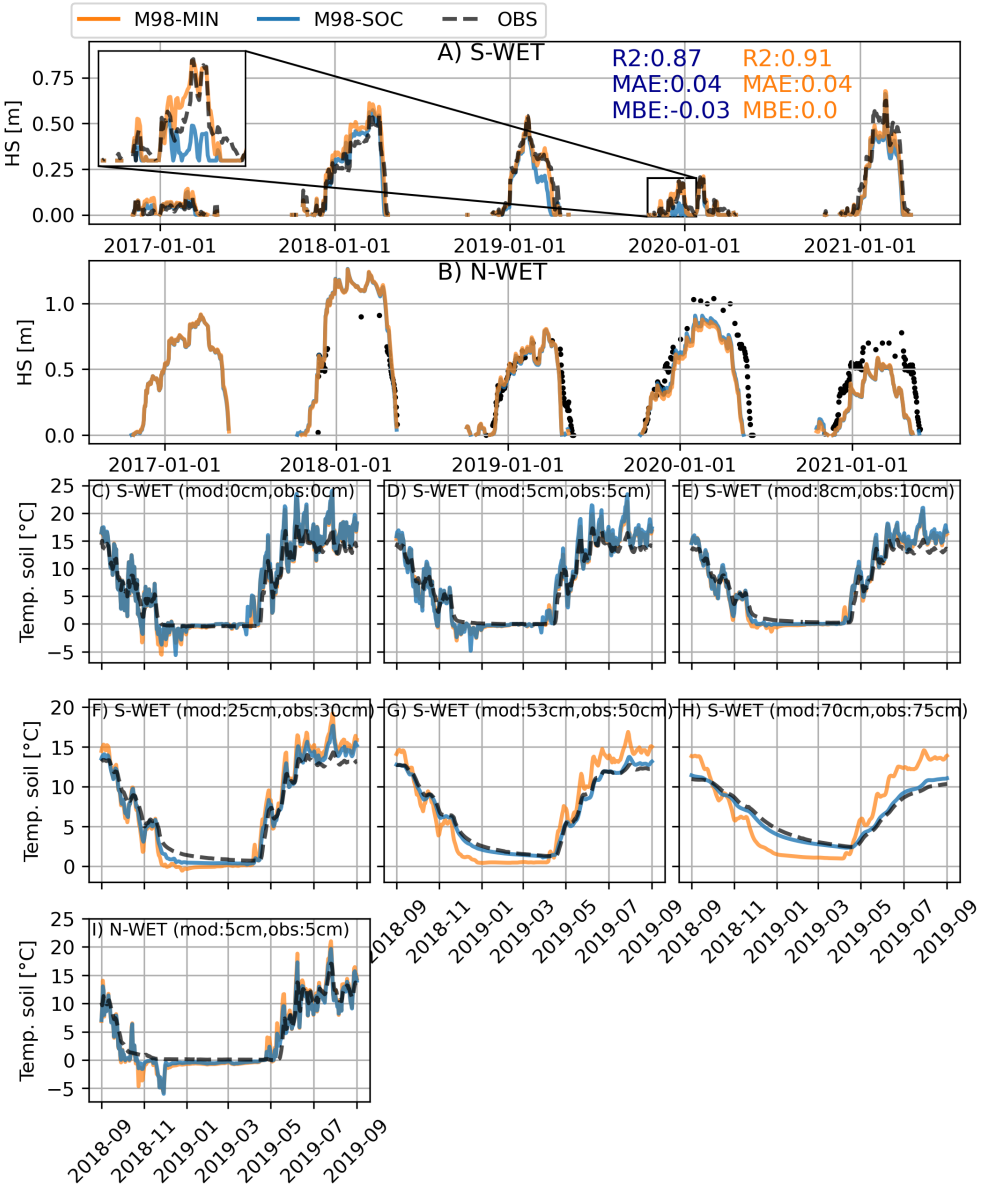

Figure S2. The effect of soil parameterization on simulated and observed snow depth (HS: A,B), and soil temperature profiles (C-I) during a hydrological year. M98-MIN refers to mineral soil and M98-SOC to peat soil. The soil depths of measurements and simulations are presented in each panel.

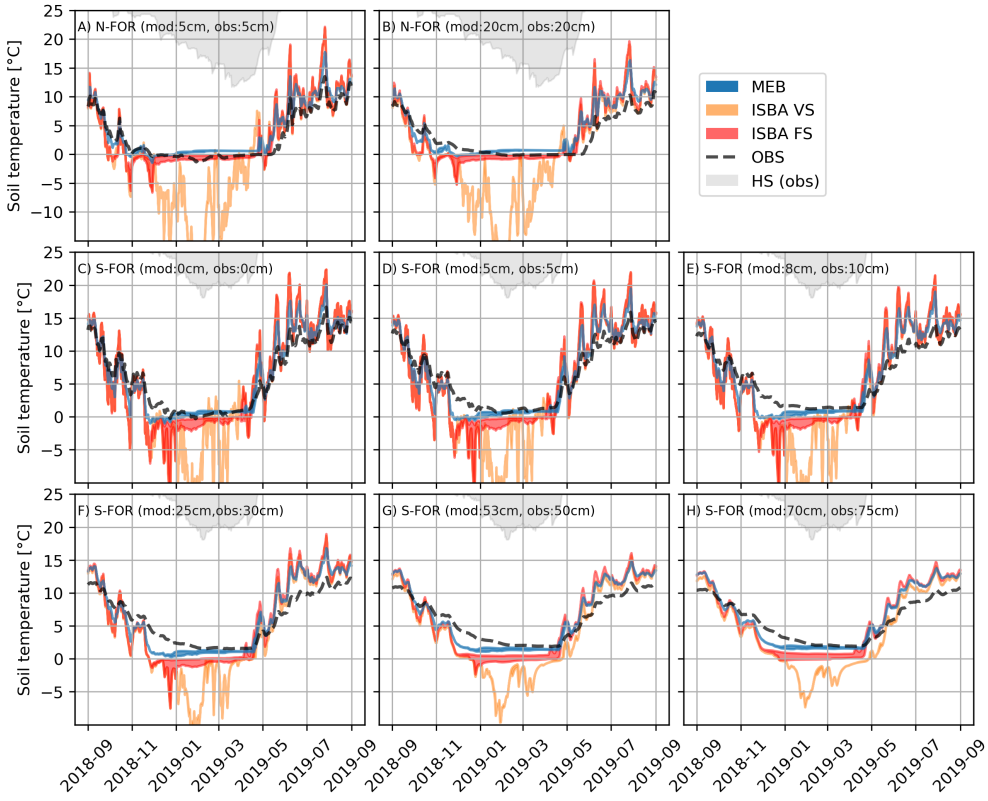

Figure S3. Effect of alternative configurations of ISBA and MEB on soil temperature profile. The envelopes visualize the corresponding ensemble spreads. The observed evolution of the snow depth (HS) is not in scale. The soil depths of measurements and simulations are presented in each panel.

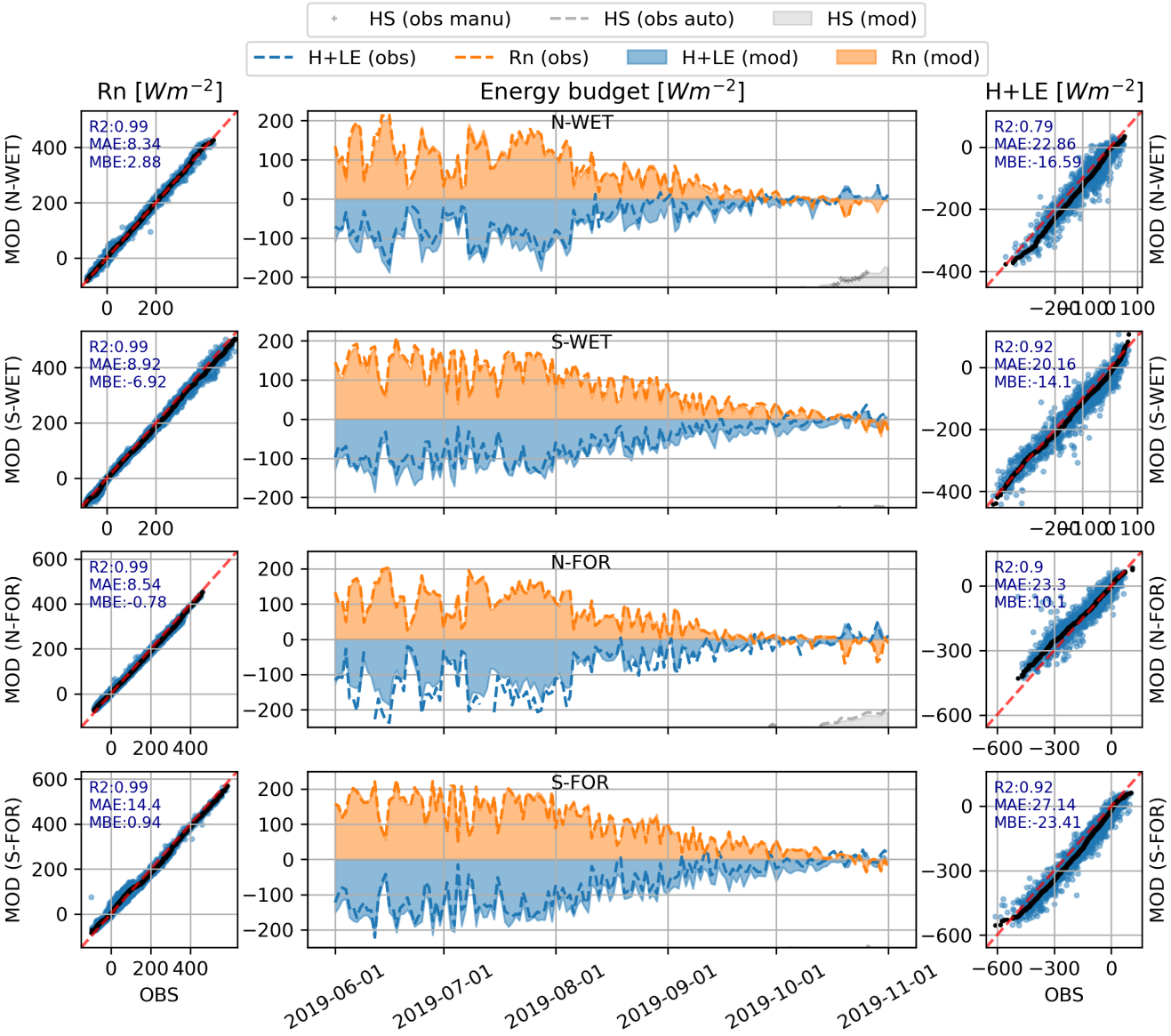

Figure S4. Simulated (MOD) against observed (OBS) daily surface energy budget during summer 2018-2019 (center column). Left column shows net radiation (R_n) and right column the sum of sensible (H) and latent (LE) heat fluxes. The scatter plots represent full simulation periods with snow free conditions.

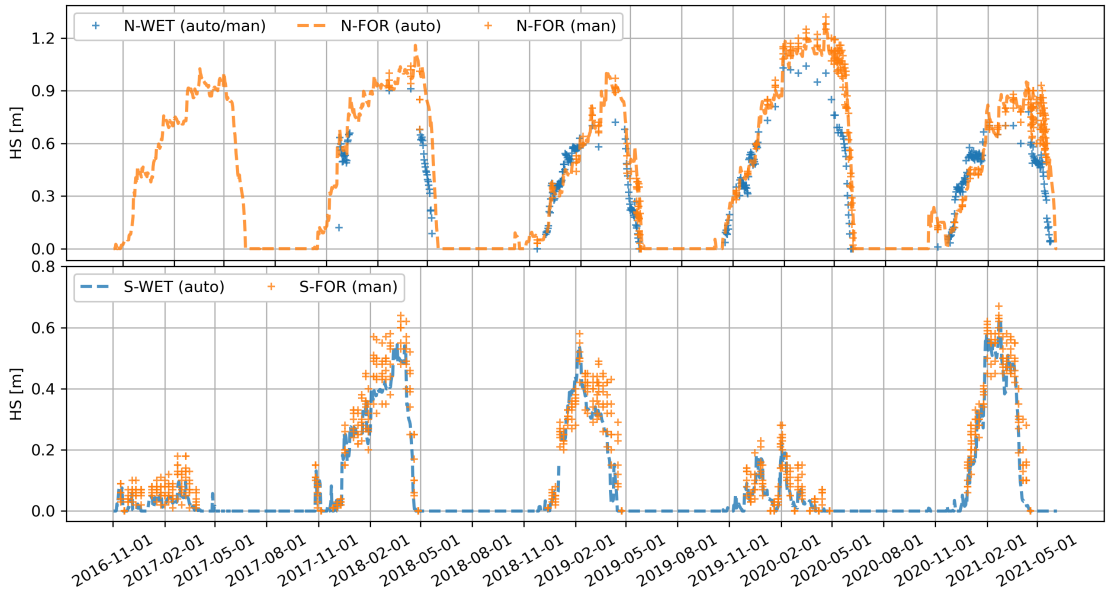

Figure S5. Snow depth (HS) observations in forest sites vs. nearby peatland sites

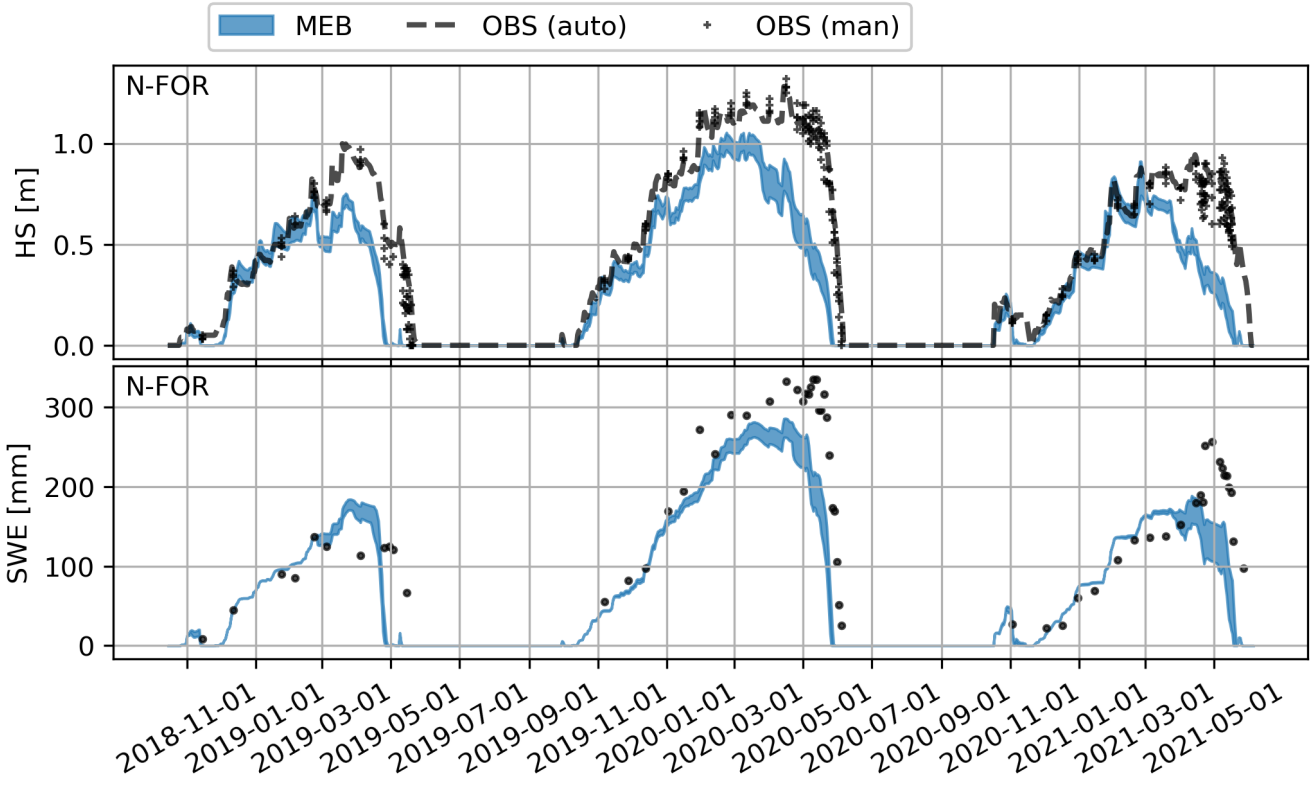

Figure S6. MEB simulations against observed snow depth (HS) and snow water equivalent (SWE) on N-FOR site.

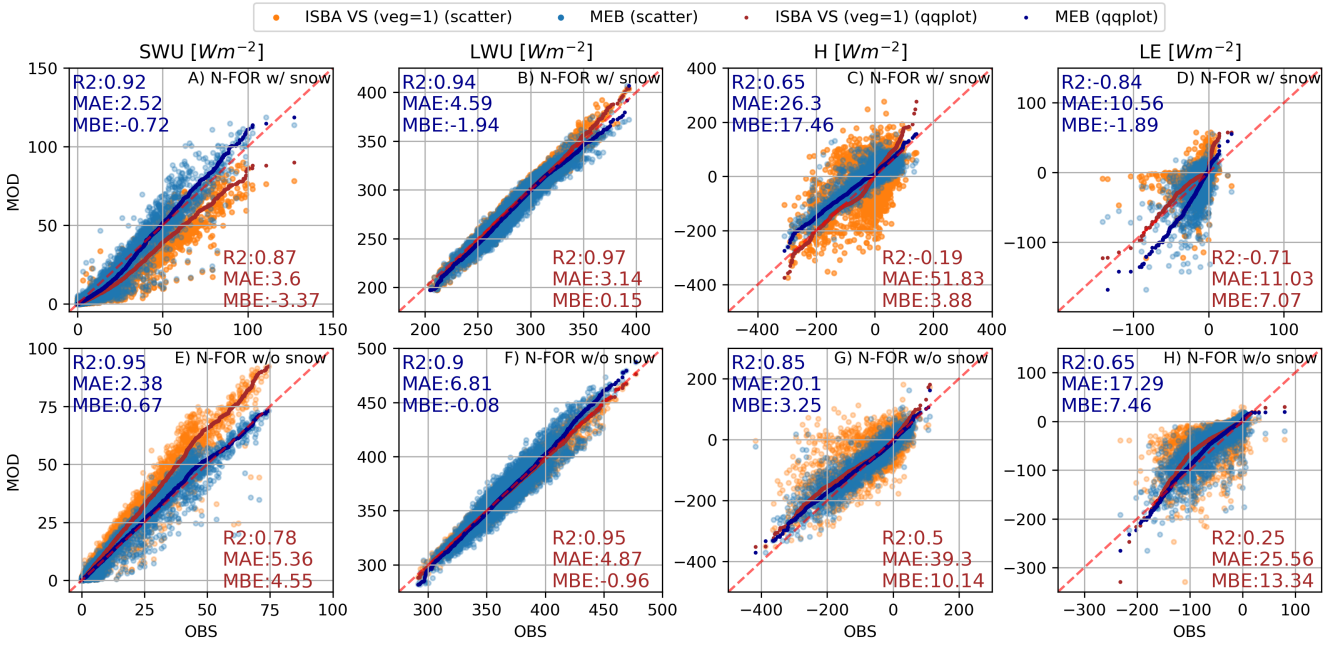

Figure S7. Simulated against observed upwards short and longwave radiation (SWU and LWU, columns 1 and 2) and turbulent fluxes (H and LE, columns 3 and 4) on N-FOR site for the full evaluation period. Ground conditions are presented as i) with snow cover (w/ snow, row 1) and ii) without snow cover (w/o snow, row 2).

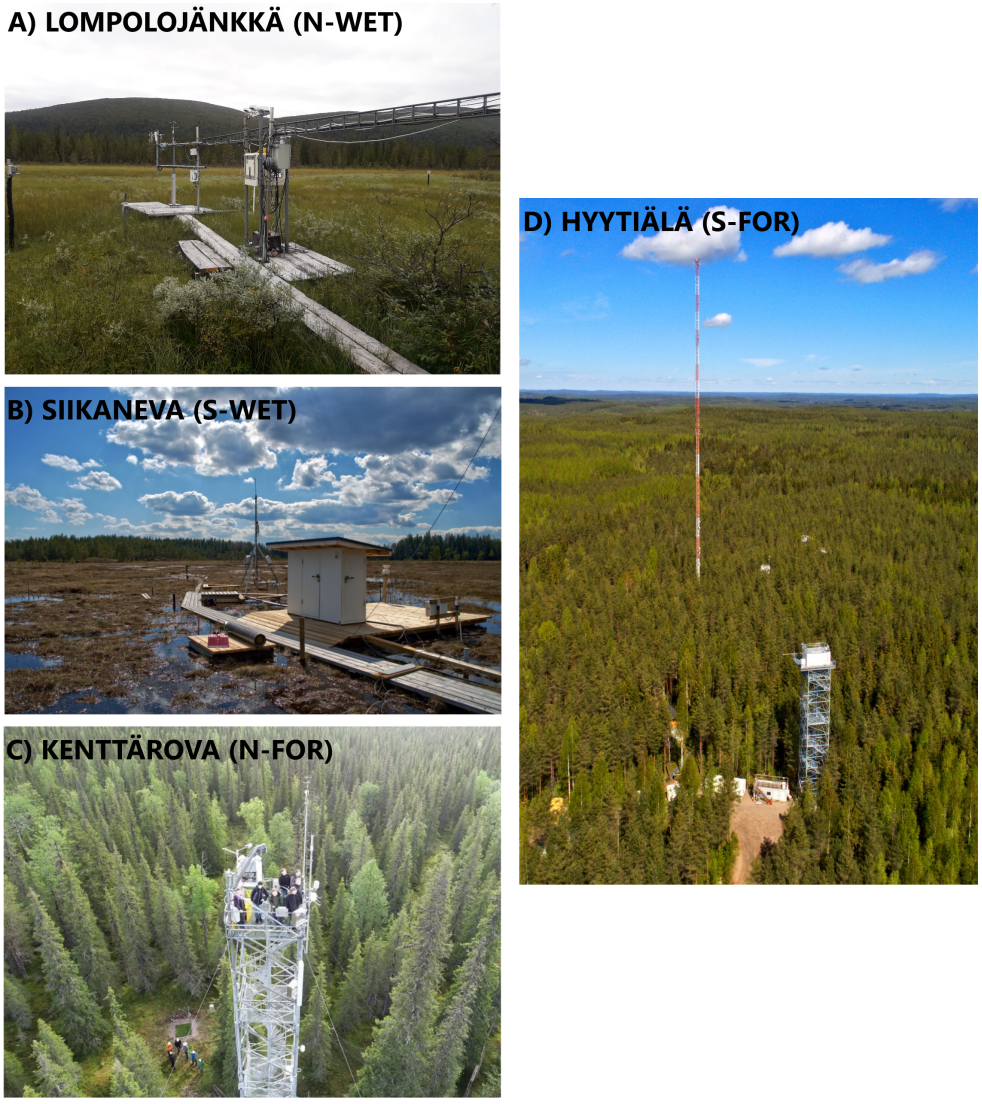

Figure S8. Study site pictures (Lompolojänkkä (Pertti Ala-Aho), Siikaneva (Alekseychik et al. 2022), Kenttärova (Bastian Steinhoff-Knopp), Hyytiälä (Kolari et al. 2022)).