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# Evapotranspiration intensification over unchanged temperate vegetation in the Baltic states is being driven by climate shifts

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Shifts in climate driven by anthropogenic land use and land cover change are expected to alter various land–atmosphere interactions. Evapotranspiration (ET) is one of these processes and plays a fundamental role in the hydrologic cycle. Using gridded reanalysis and remote sensing data, we investigated the spatiotemporal trends of precipitation, temperature, and ET for croplands and forest areas in the Baltic states where these land cover type had not changed from 2000 to 2018. We focused on ET but investigated the spatiotemporal trends for the three variables at monthly, seasonal, and annual time scales during this period to quantify trade-offs among months and seasons. We used the Mann-Kendall test and Sen's slope to calculate the trends and rate of change for the three variables. Although precipitation showed fewer statistically significant increasing and decreasing trends due to its high variability, temperature showed only increasing trends in all time scales. The increasing trends were concentrated in late spring (May, +0.14ºC per year), summer (June and August, +0.10ºC), and early autumn (September, +0.13ºC). For unchanged forest and cropland areas, we found no statistically significant ET trends. However, Sen's slope indicated increasing ET in April, May, June, and September for forest areas and in May and June for cropland. Our results indicate that during the study period, the temperature changes may have lengthened the growing season, which affected the ET patterns of forest and cropland areas. The results also provide important insights into the regional water balance, specially for critical periods where the ET rates increase while precipitation decrease (May, June. and July). Moreover, our study also complements the findings of other studies over the Baltic states.