

**Figure S1** (top) Mean SWE in April for CMIP6 multi-model ensemble mean, SnowCCI and the difference CMIP6-SnowCCI for the period 1982-2014. (middle) Mean P in April for CMIP6 multi-model ensemble mean, GPCC and the difference CMIP6-GPCC for the period 1982-2014. (bottom) Mean T in April for CMIP6 multi-model ensemble mean, MERRA-2 and the difference CMIP6-MERRA-2 for the period 1982-2014.

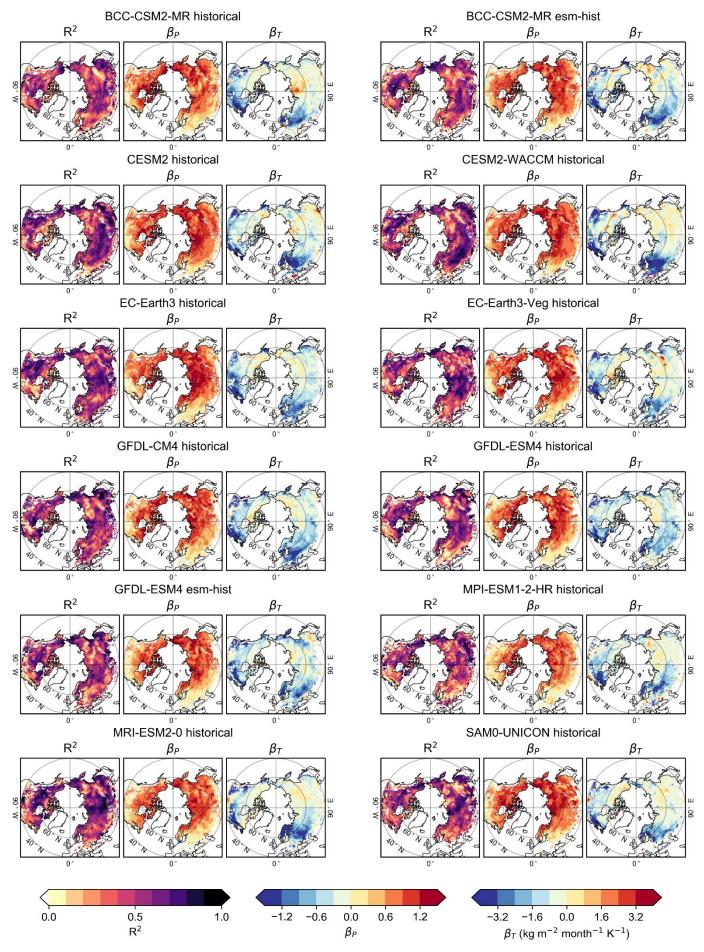


Figure S2. Linear regression parameters  $R^2$ ,  $\beta_P$ , and  $\beta_T$  in winter 1982-2014.

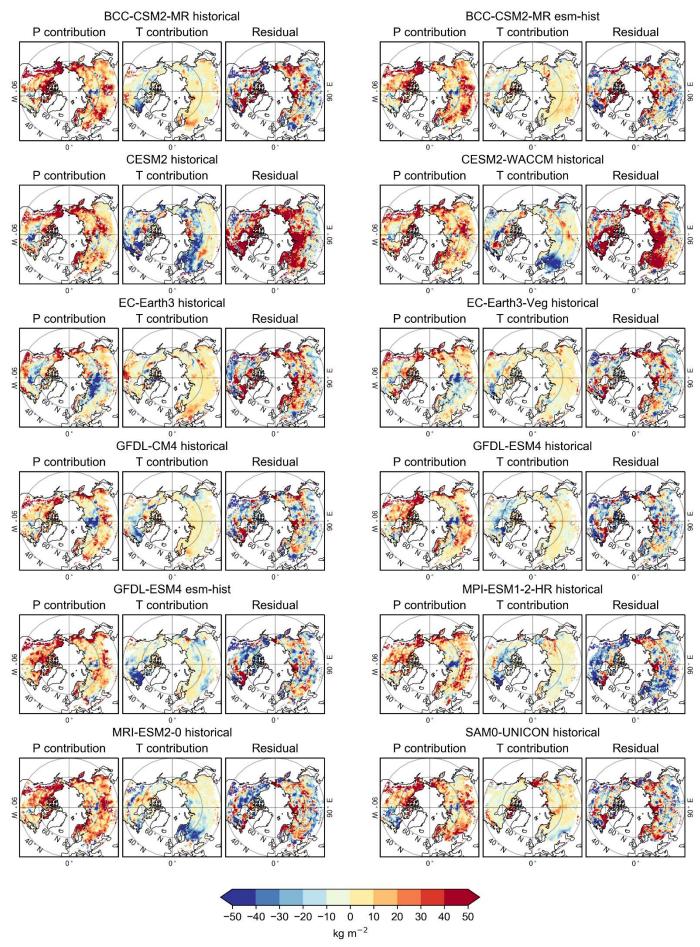


Figure S3. Spatial distribution of P contribution, T contribution and constant for each model in winter 1982-1991.

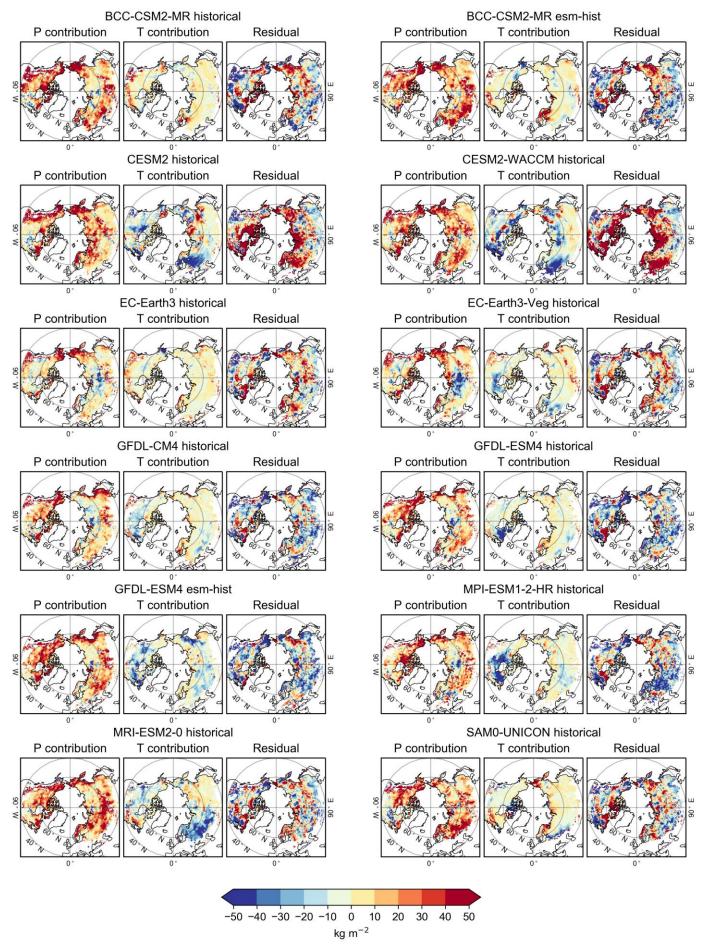


Figure S4. Spatial distribution of P contribution, T contribution and constant for each model in winter 1992-2001.

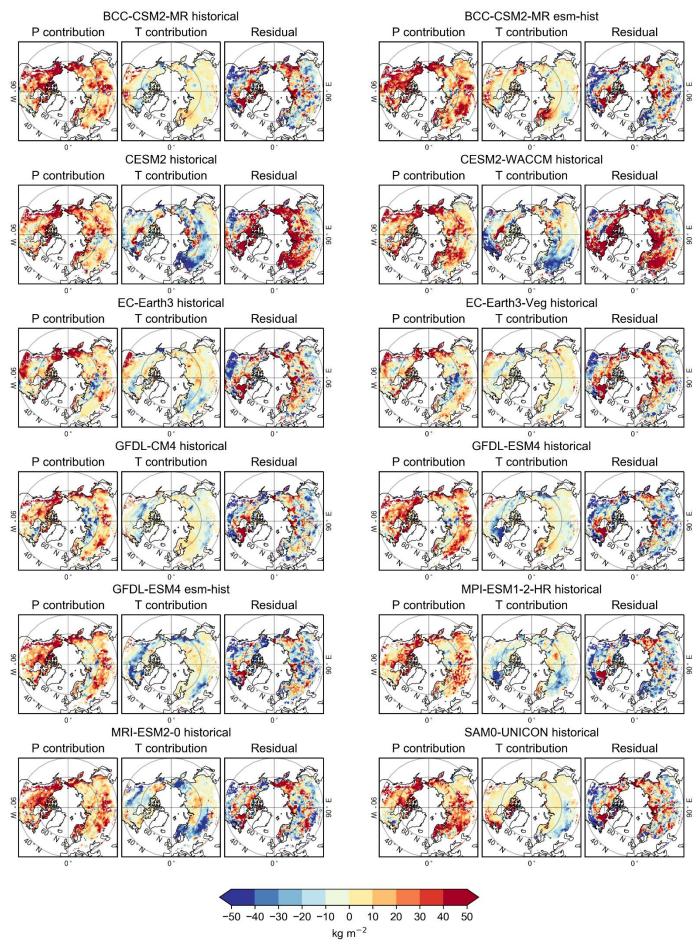


Figure S5. Spatial distribution of P contribution, T contribution and constant for each model in winter 2002-2014.

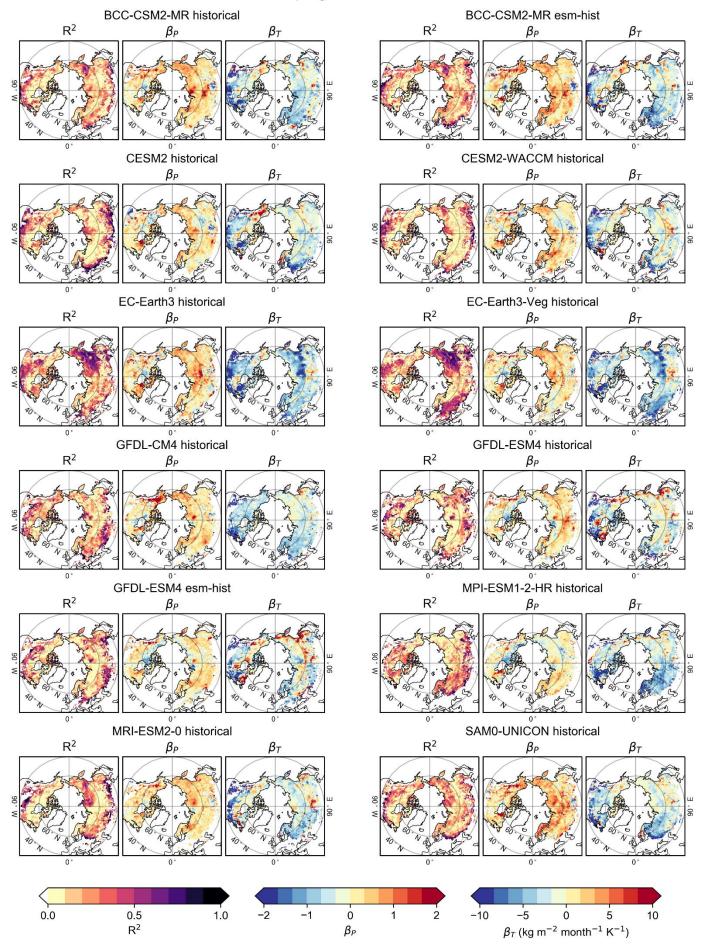


Figure S6. Linear regression parameters  $R^2$ ,  $\beta_P$ , and  $\beta_T$  in spring 1982-2014.

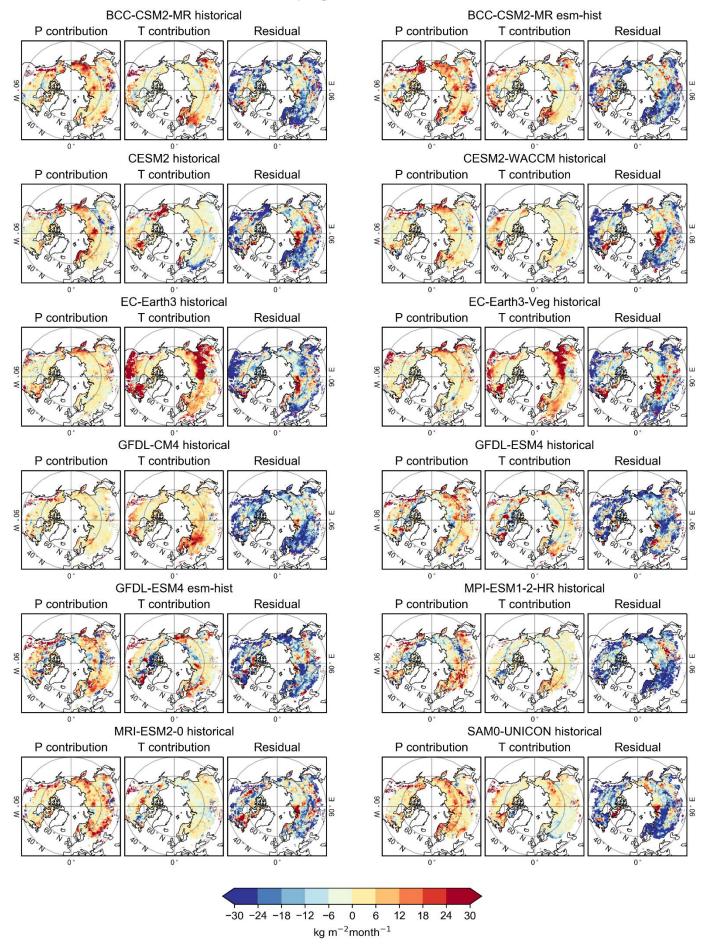


Figure S7. Spatial distribution of P contribution, T contribution and constant for each model in spring 1982-1991.

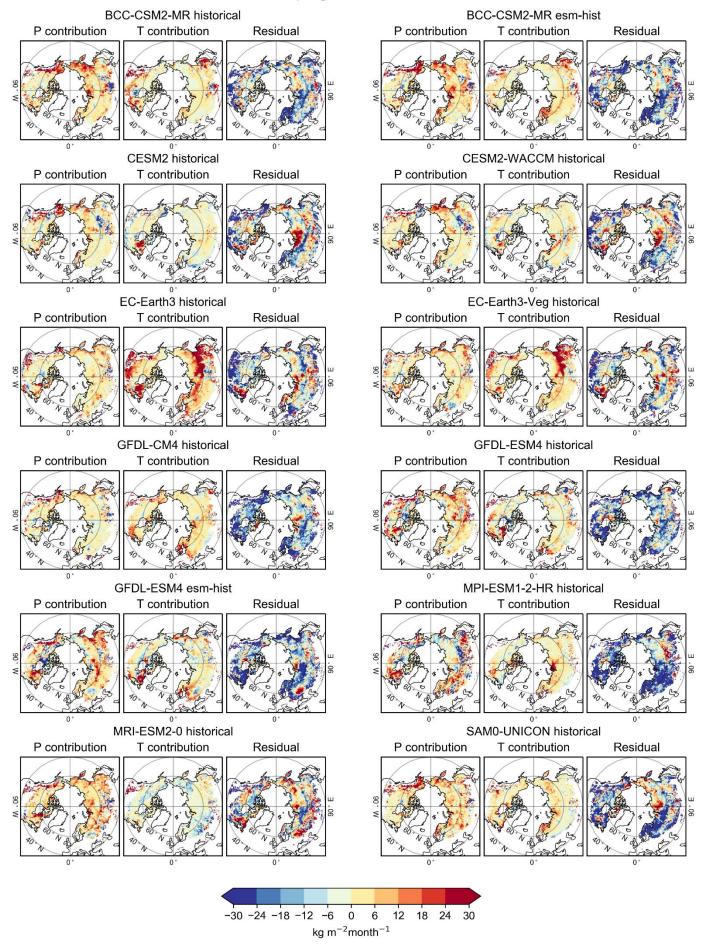


Figure S8. Spatial distribution of P contribution, T contribution and constant for each model in spring 1992-2001.

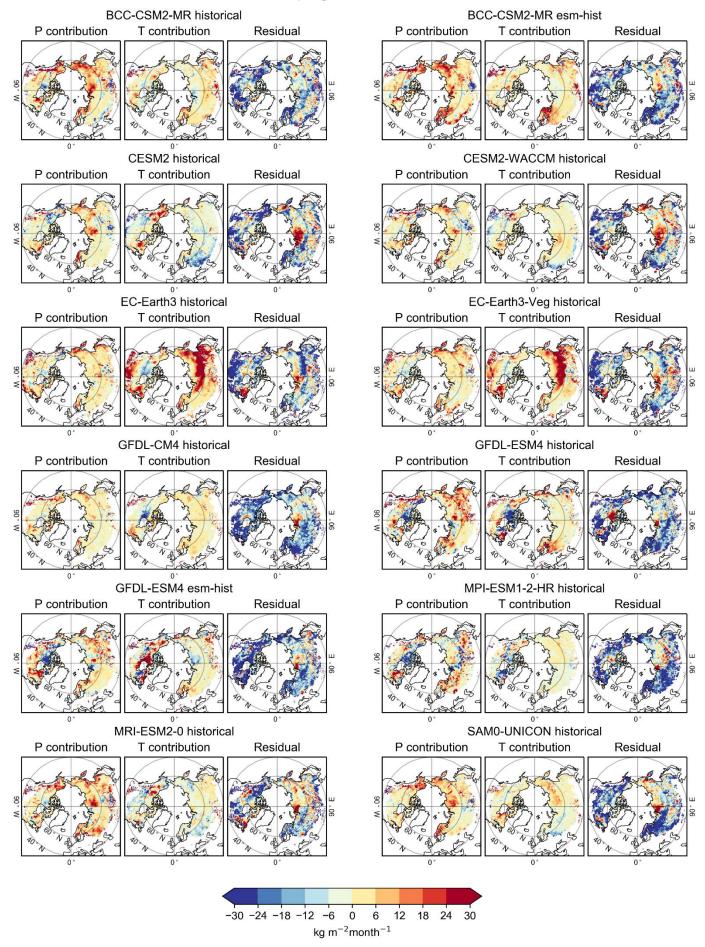


Figure S9. Spatial distribution of P contribution, T contribution and constant for each model in spring 2002-2014.