Supplemental figures and tables.

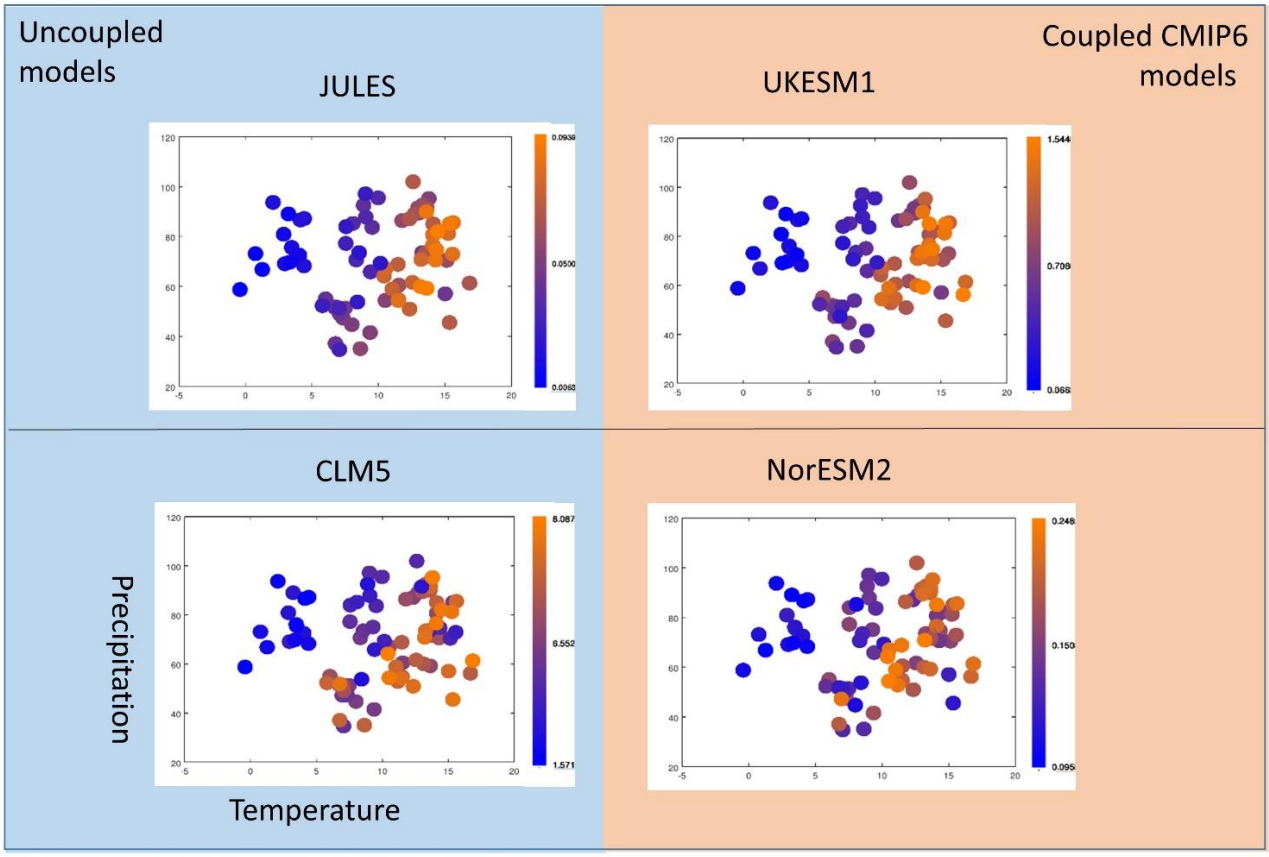

Figure S1. Temperature and precipitation responses of wetland methane emissions in Fennoscandia from JULES ecosystem model, uncoupled (left) and coupled (right) with UKESM1, and CLM5 model, uncoupled (left) and coupled (right) with NorESM2. Circles refer to monthly averages in May - October during years 2000-2017.

CTE-CH4	Posterior	emission		Posterior/prior	flux	multiplier
Prior	R2 Temp	R2 Prec	R2 T&P	R2 Temp	R2 Prec	R2 T&P
LPX-Bern	0.01	0.57	0.57	0.48	0.15	0.59
JSBACH-H	0.72	0.06	0.75	0.01	0.38	0.40
GCP-prior	0.48	0.33	0.75	0.09	0.05	0.12

Table S1. Proportion of explained CH_4 emission and flux multiplier variances by temperature and precipitation. Flux results are from CTE-CH4 inversion model using three different priors (LPX-Bern, JSBACH-H and GCP-prior).

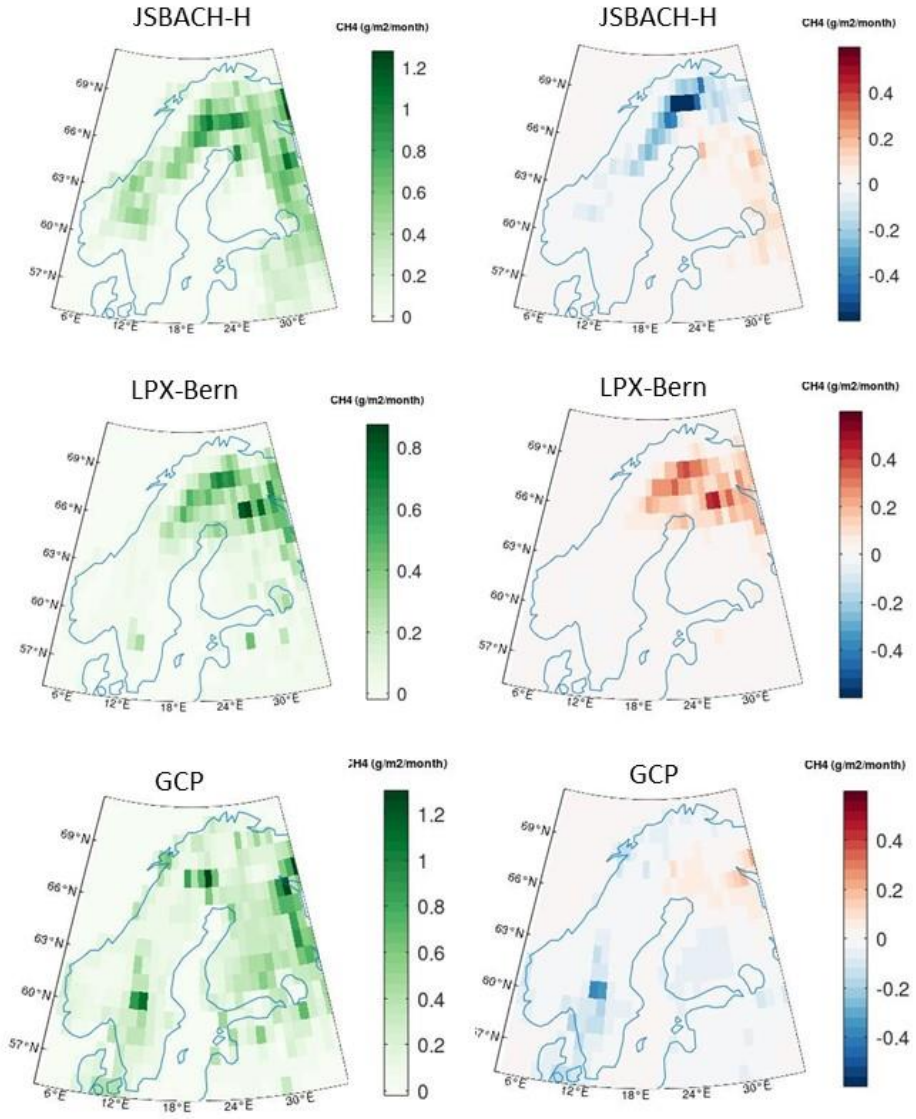

Figure S2. The posterior methane fluxes estimated by CTE-CH4 using JSBACH-H, LPX-Bern and GCP as priors (left column), and the difference between posterior and prior fluxes (right column).

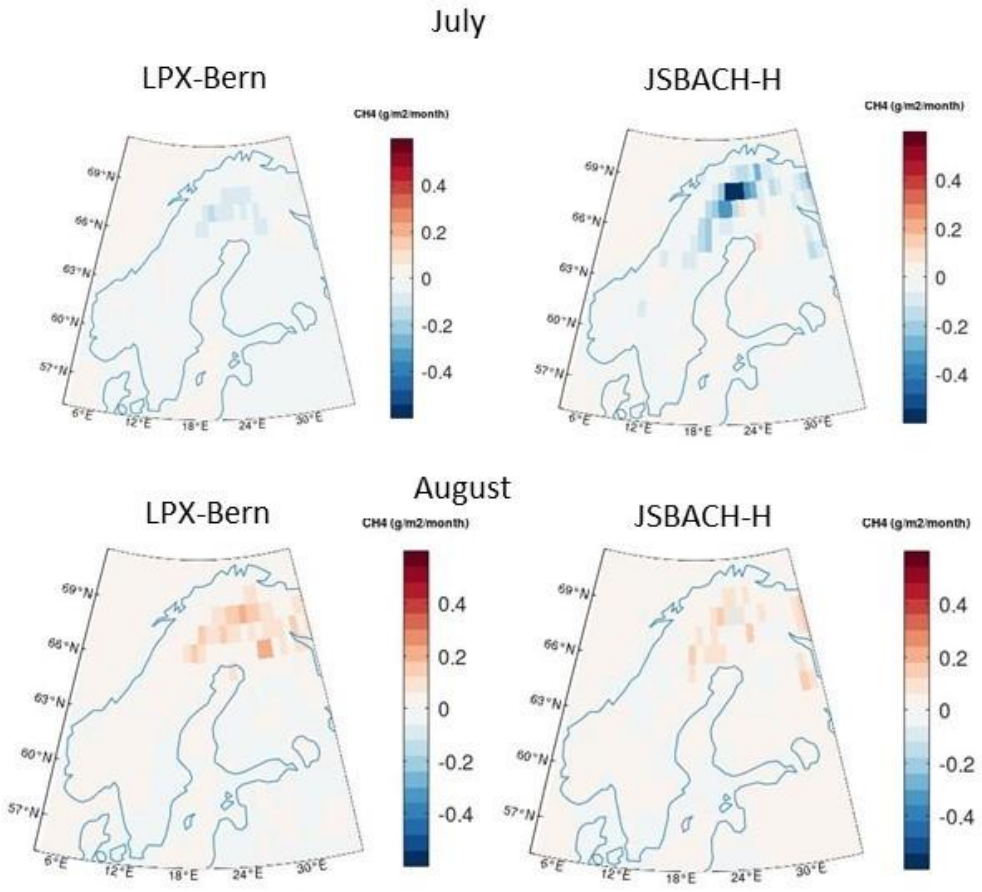

Figure S3. The deviation of the monthly posterior - prior flux adjustment, estimated by CTE-CH4 and using JSBACH-H or LPX-Bern as priors, from the seasonal average flux adjustment. The deviation was calculated as follows: ($F_{post,month}$ - $F_{prior,month}$) - ($F_{post,\ three\text{-}month\ average}$ − $F_{prior,\ three\text{-}month\ average}$). Thus, in the case of JSBACH-H where seasonal average emissions were decreased in the posterior, they were decreased less in August and the deviation was positive. In the case of LPX-Bern the seasonal average emissions were increased in the posterior, and they were increased more in August, resulting in positive deviation.