

Supplement of Geosci. Model Dev., 13, 5959–5971, 2020
<https://doi.org/10.5194/gmd-13-5959-2020-supplement>
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Supplement of

Improving Yasso15 soil carbon model estimates with ensemble adjustment Kalman filter state data assimilation

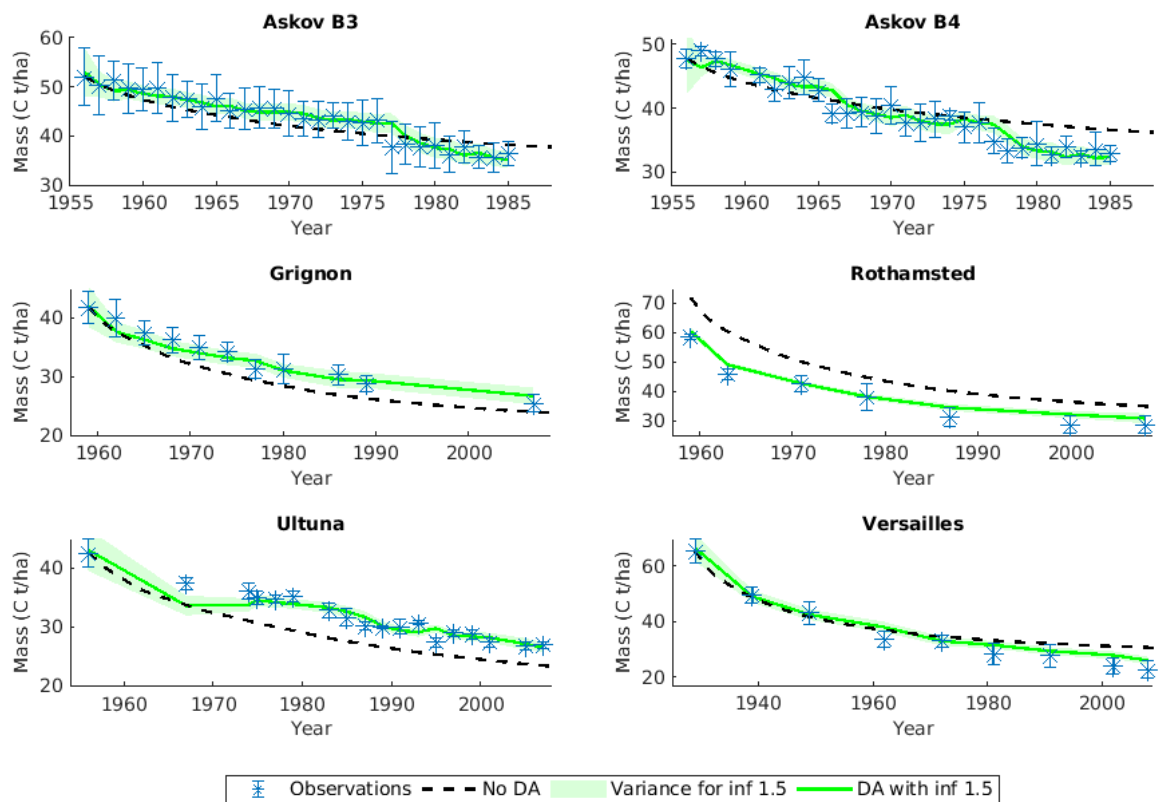
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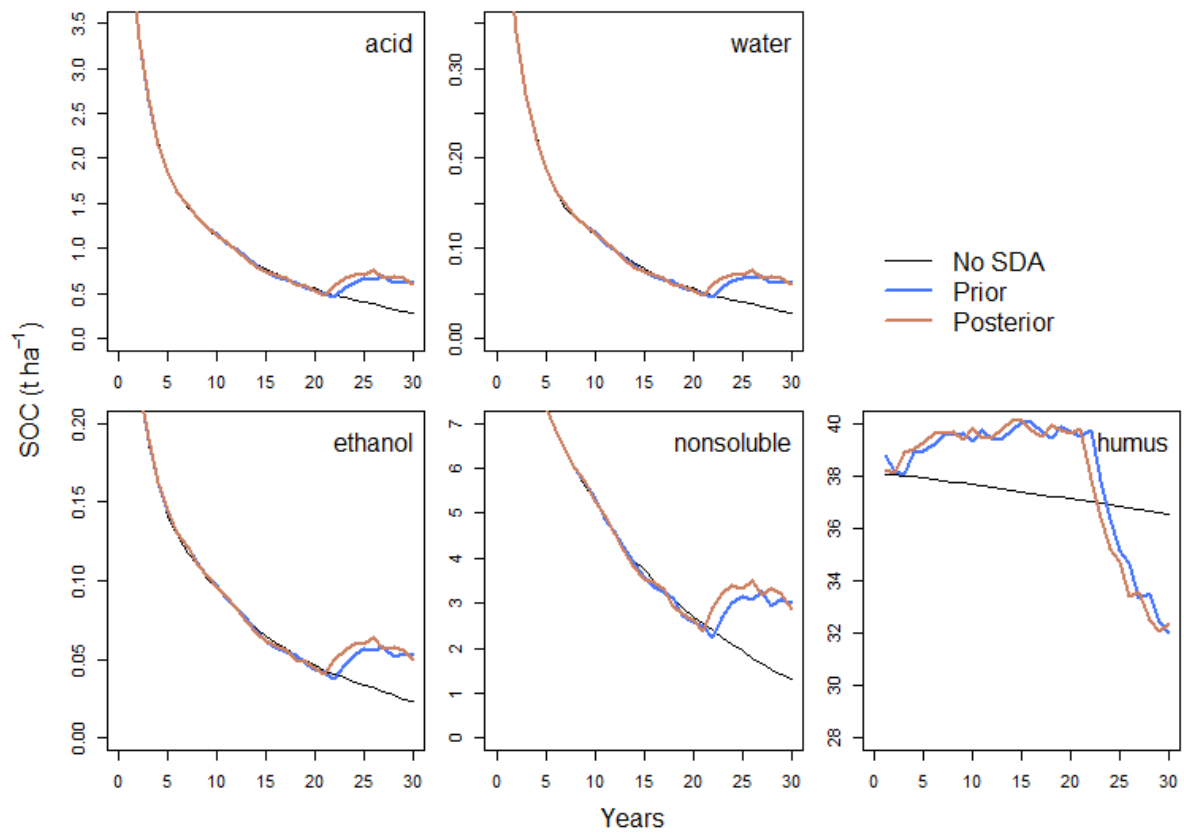
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parameter	2.5 %	mean	97.5 %
α_A	0.44	0.49	0.54
α_W	4.5	4.9	5.4
α_E	0.22	0.24	0.27
α_N	0.075	0.095	0.12
ρ_{WA}	0.4	0.44	0.48
ρ_{EA}	0.044	0.25	0.46
ρ_{NA}	0.84	0.92	0.98
ρ_{AW}	0.99	0.99	1
ρ_{EW}	0.0027	0.084	0.26
ρ_{NW}	0.00029	0.011	0.041
ρ_{AE}	1.60E-05	0.00061	0.0022
ρ_{WE}	1.20E-05	0.00048	0.0018
ρ_{NE}	0.0074	0.066	0.14
ρ_{AN}	2.00E-05	0.00077	0.0028
ρ_{WN}	0.086	0.1	0.12
ρ_{EN}	0.47	0.65	0.82
β_1	0.084	0.091	0.1
β_2	-0.00054	-0.00021	-1.20E-05
β_{N1}	0.039	0.049	0.059
β_{N2}	-0.00029	-7.90E-05	-1.90E-06
β_{H1}	0.028	0.035	0.047
β_{H2}	-0.0006	-0.00021	-8.60E-06
γ	-1.9	-1.8	-1.7
γ_N	-1.5	-1.2	-0.91
γ_H	-20	-13	-6.4
ρ_H	0.0038	0.0046	0.0054
α_H	0.0011	0.0013	0.0015

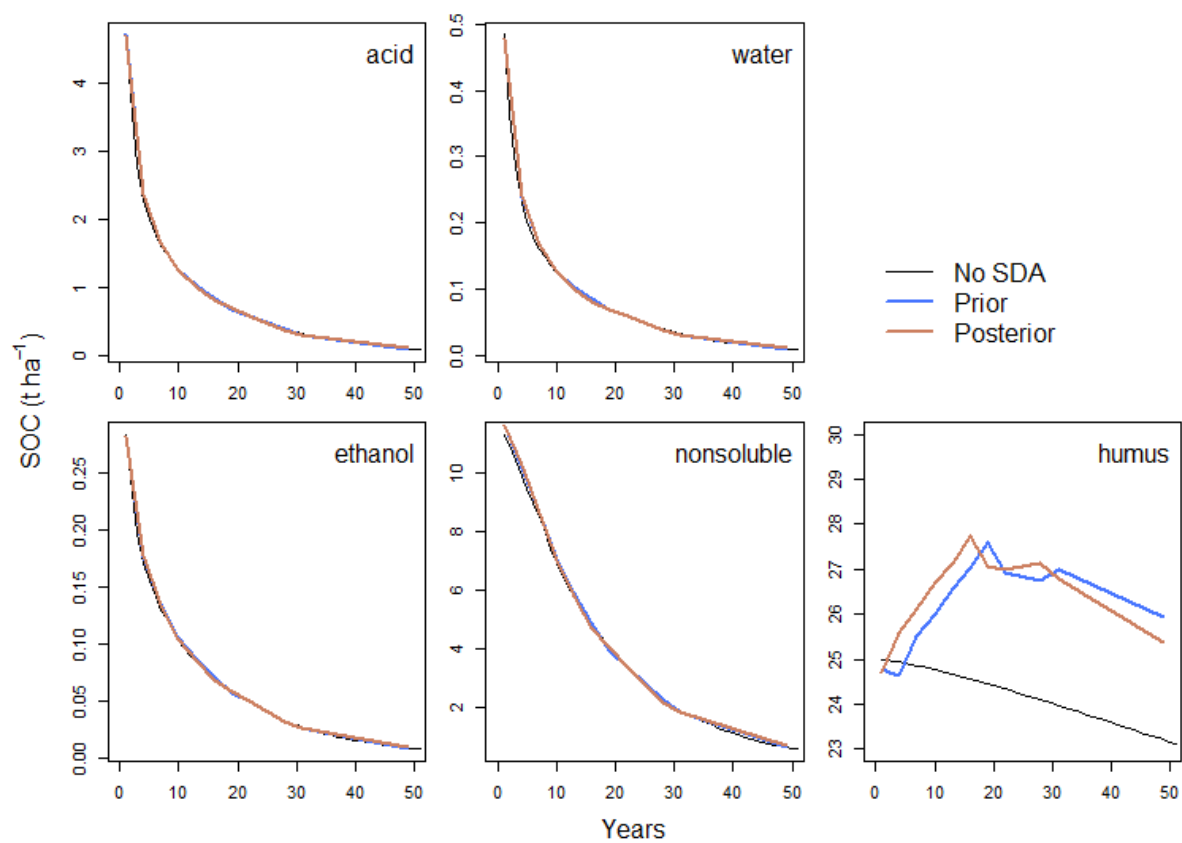
Supplemental Table S1: The calibrated parameter values for Yasso15 used in this manuscript as well as the 95 percentile uncertainty boundaries.



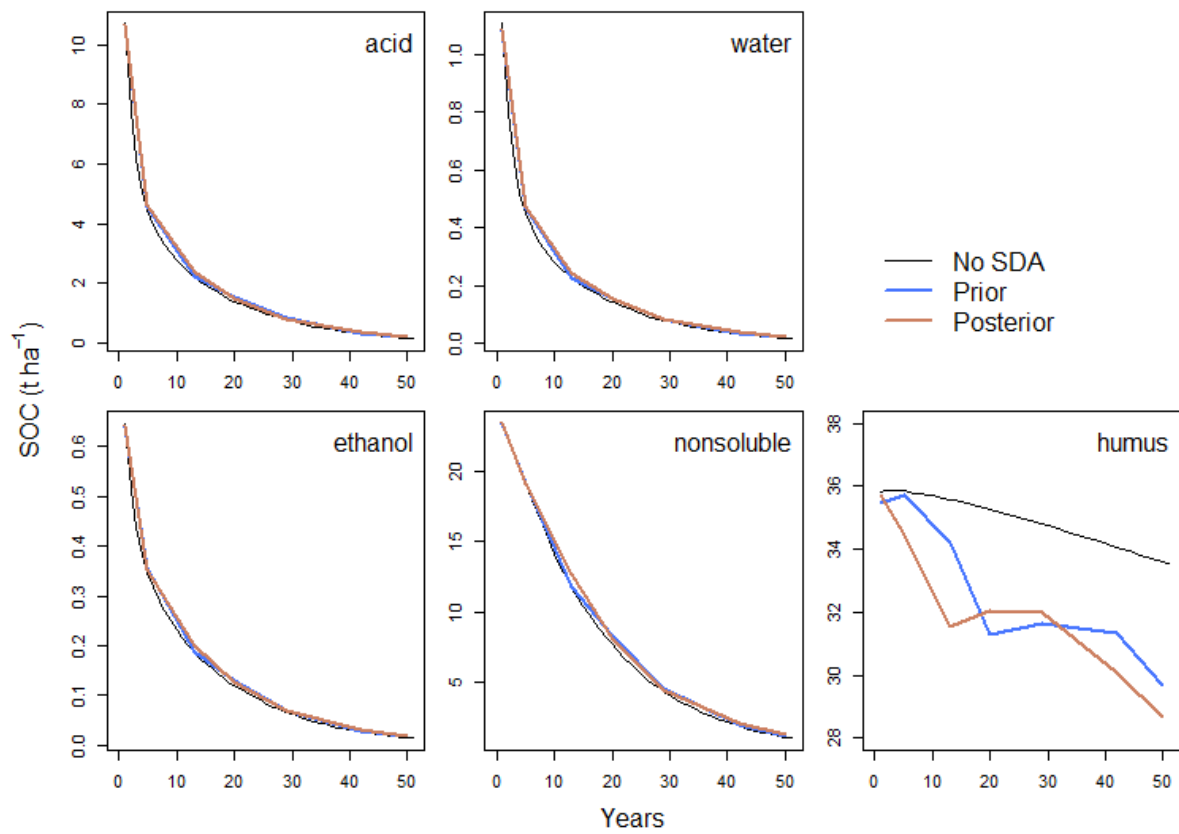
Supplemental Figure S1: Observed and modelled SOC with and without data assimilation (SDA) of all previous measurements using inflation factor of 1.5. The coloured area around the two different SDA estimates are the 95 % confidence interval.



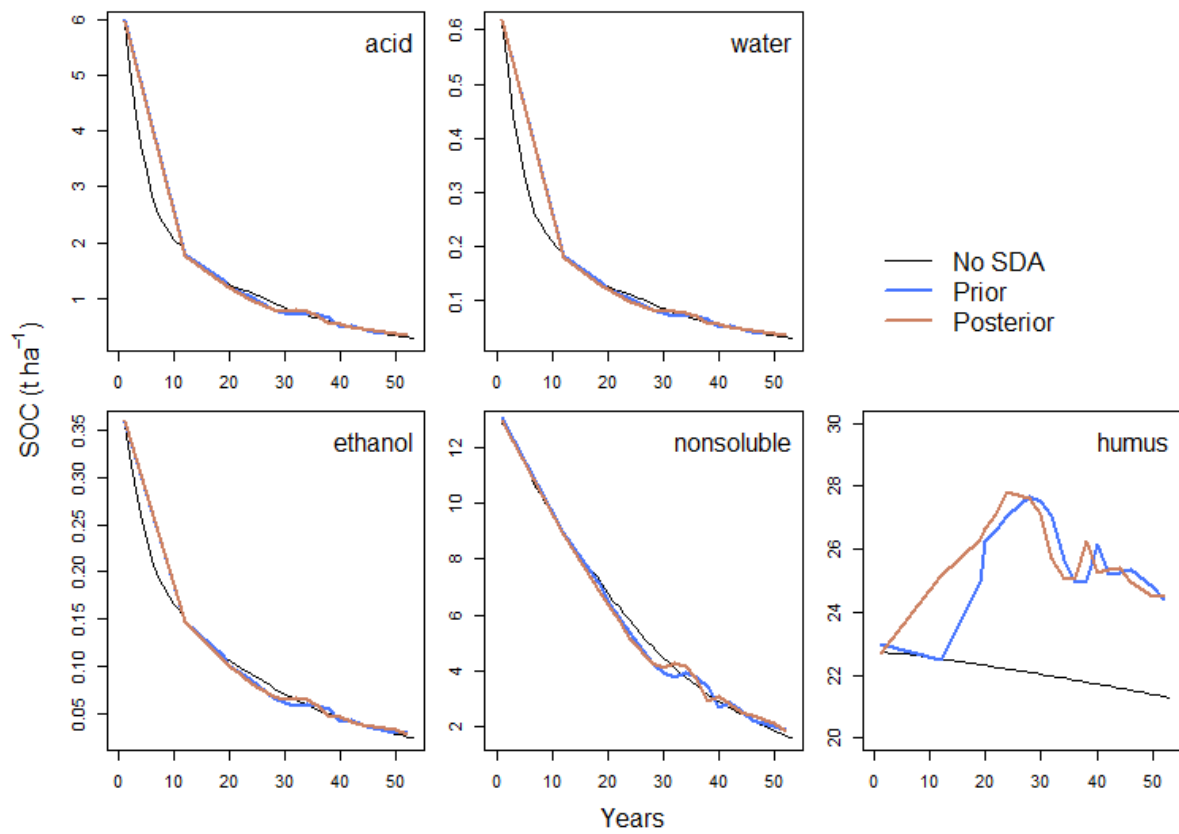
Supplemental Figure S2: The mean of prior and posterior distribution SOC pools at Askov B3 before and after each assimilated observation.



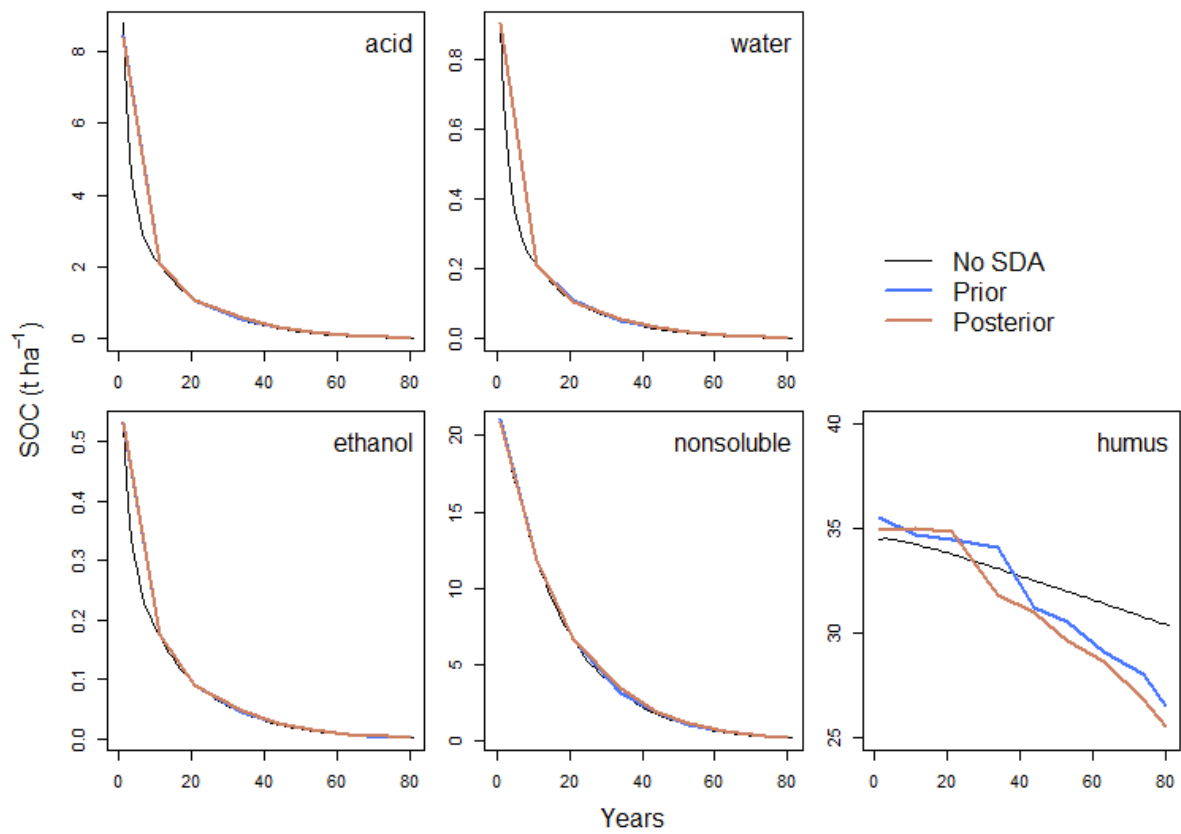
Supplemental Figure S3: The mean of prior and posterior distribution SOC pools at Grignon before and after each assimilated observation.



Supplemental Figure S4: The mean of prior and posterior distribution SOC pools at Rothamsted before and after each assimilated observation.



Supplemental Figure S5: The mean of prior and posterior distribution SOC pools at Ultuna before and after each assimilated observation.



Supplemental Figure S6: The mean of prior and posterior distribution SOC pools at Versailles before and after each assimilated observation.