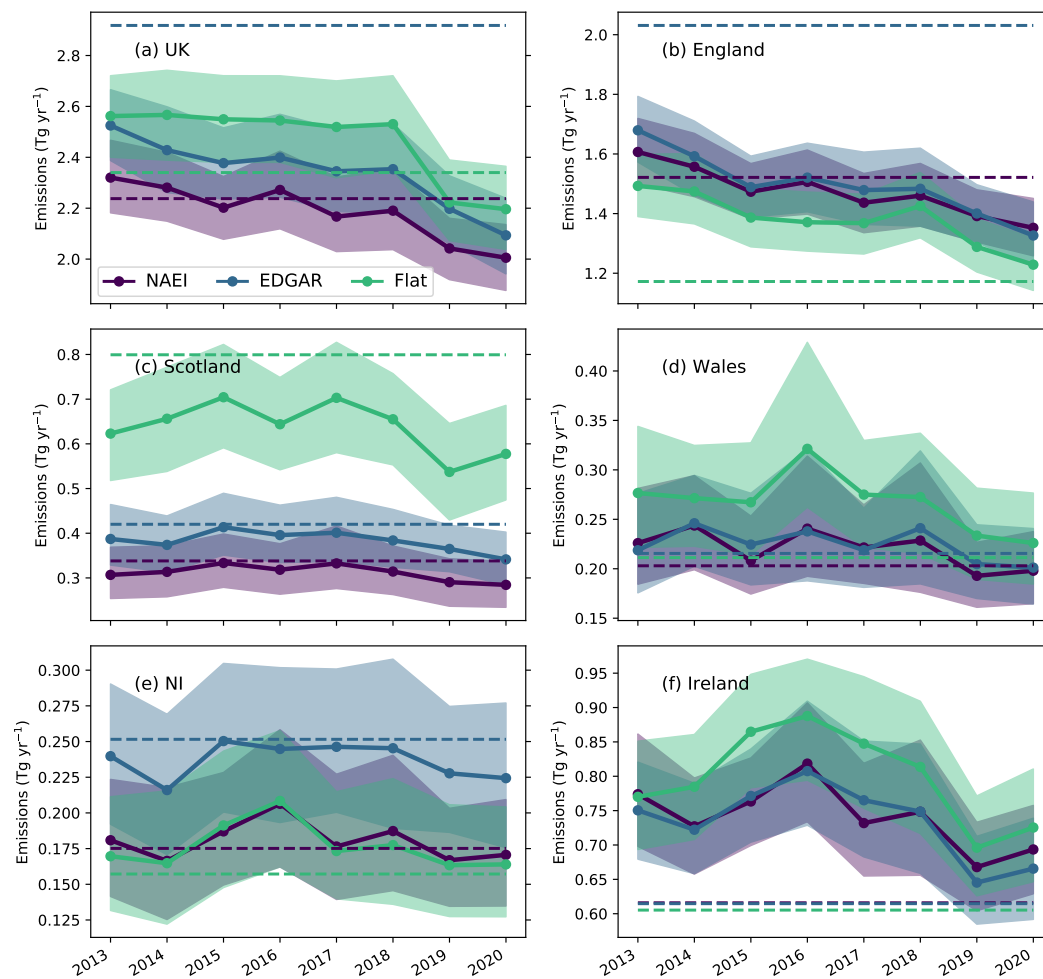


# **Supplementary material for “Atmospheric observations consistent with reported decline in the UK’s methane emissions, 2013 – 2020”**

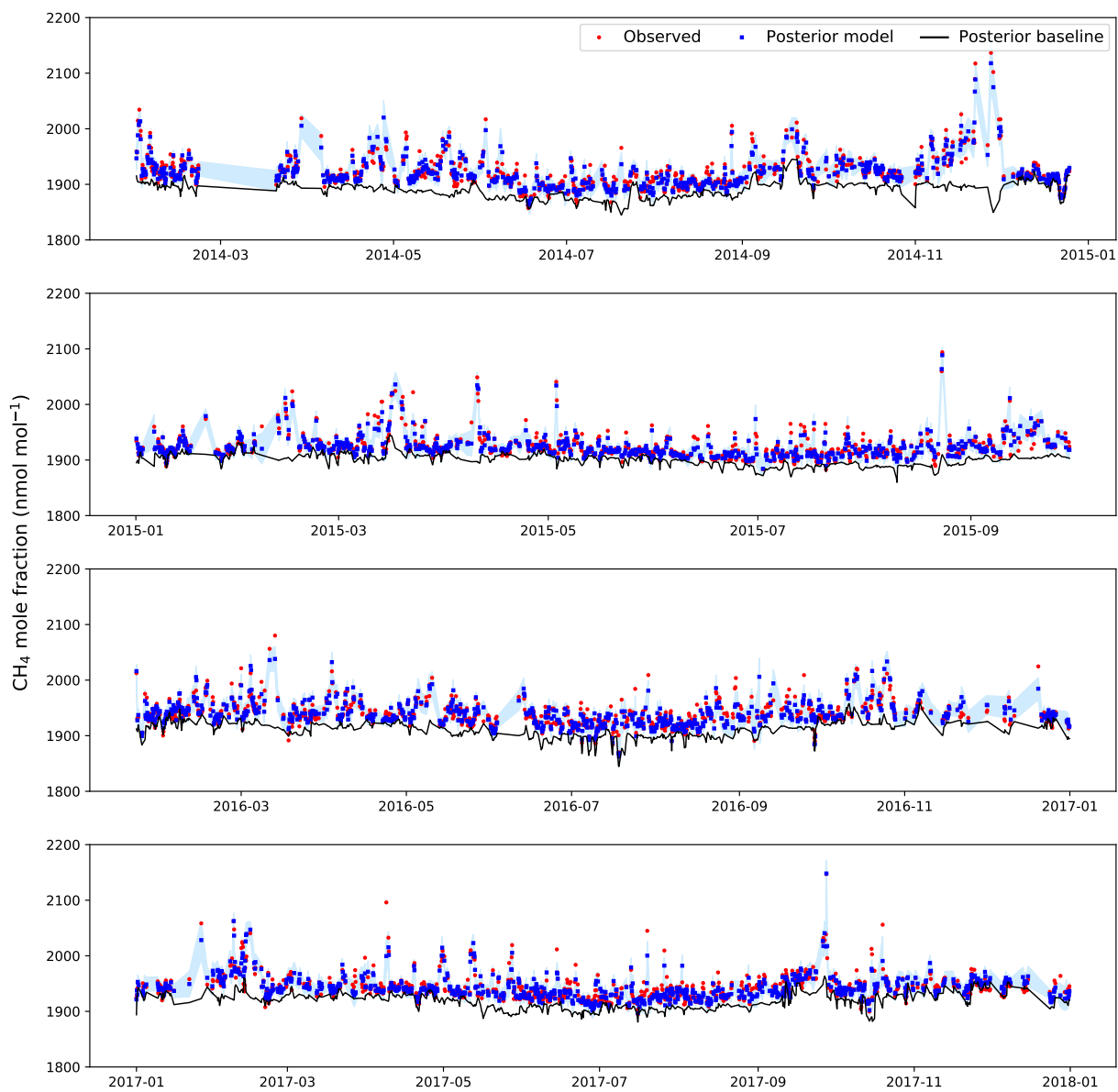
Mark F. Lunt et al.

## 1 Supplementary Figures



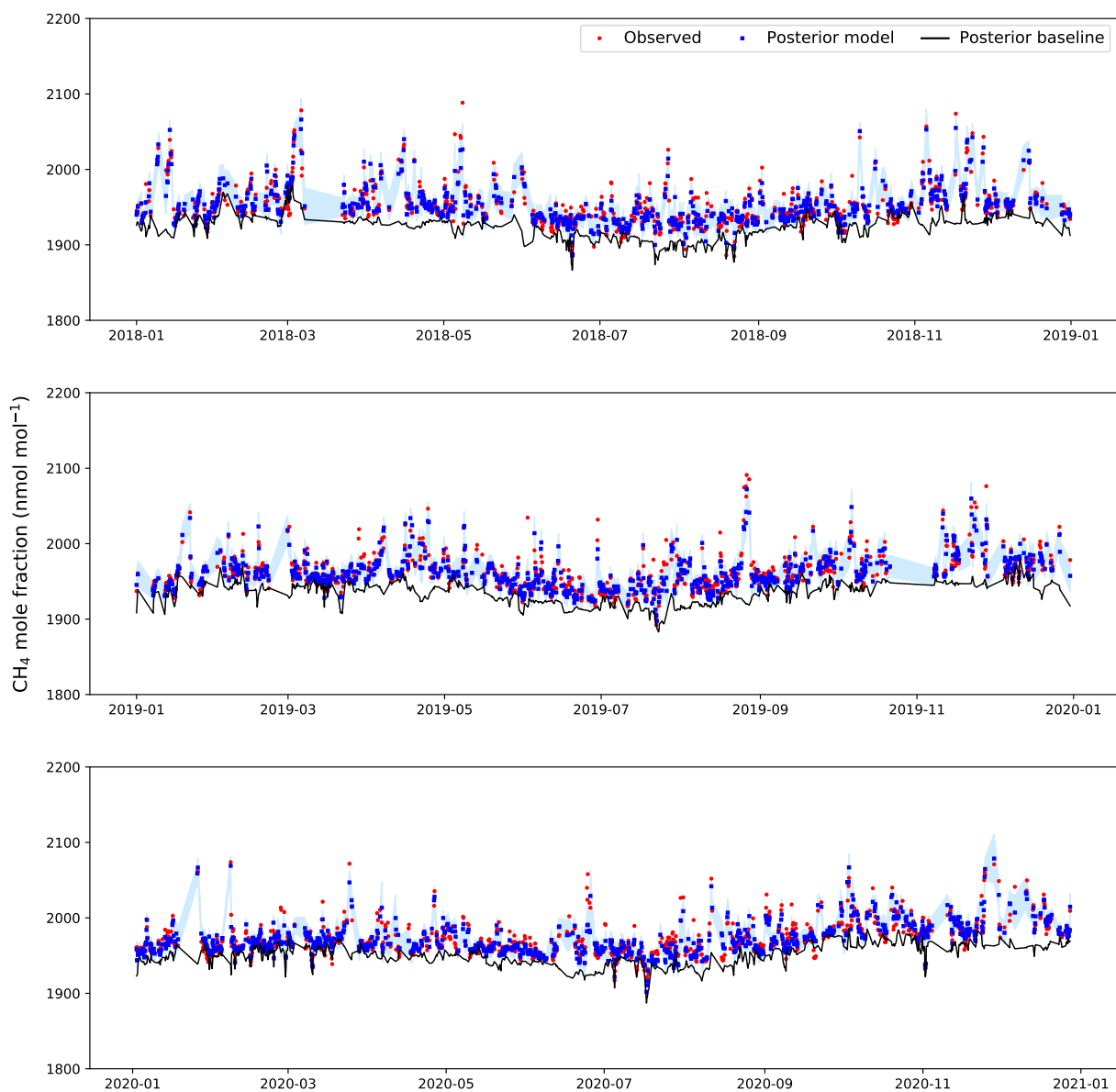
**Figure S1.** Annual mean emissions between 2013–2020 for MHD-TAC inversions using different prior distributions from the NAEI (purple), EDGAR (blue) and a flat distribution (green). Estimates are shown for (a) the UK, (b) England, (c) Scotland, (d) Wales, (e) NI and (f) Ireland. Shading represents the 95% confidence interval. Dashed lines represent the magnitudes of the respective priors.

BSD

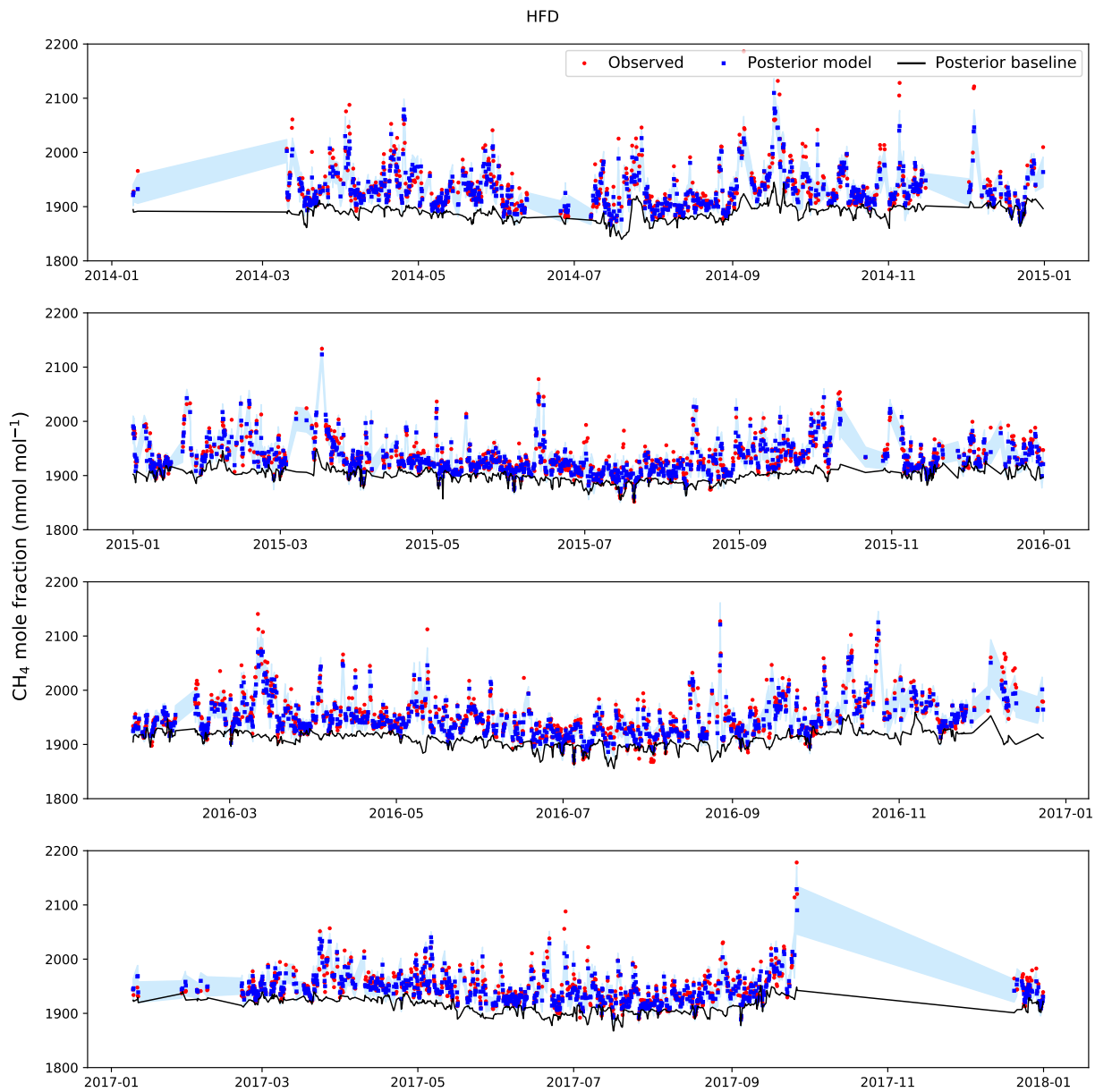


**Figure S2.** Observed (red) and modelled mole fractions (blue) at BSD between 2014–2017. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.

BSD

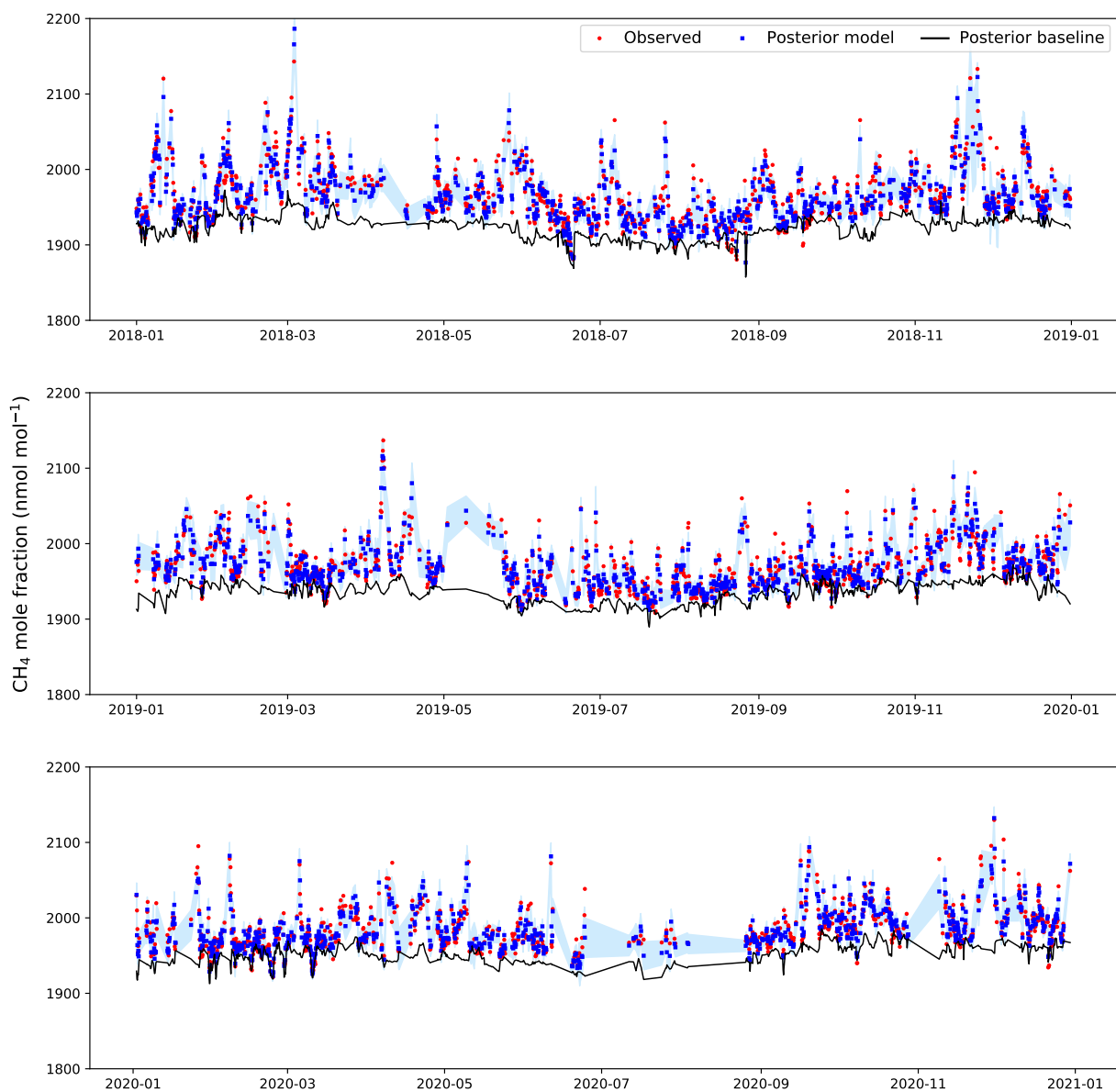


**Figure S3.** Observed (red) and modelled mole fractions (blue) at BSD between 2018–2020. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.

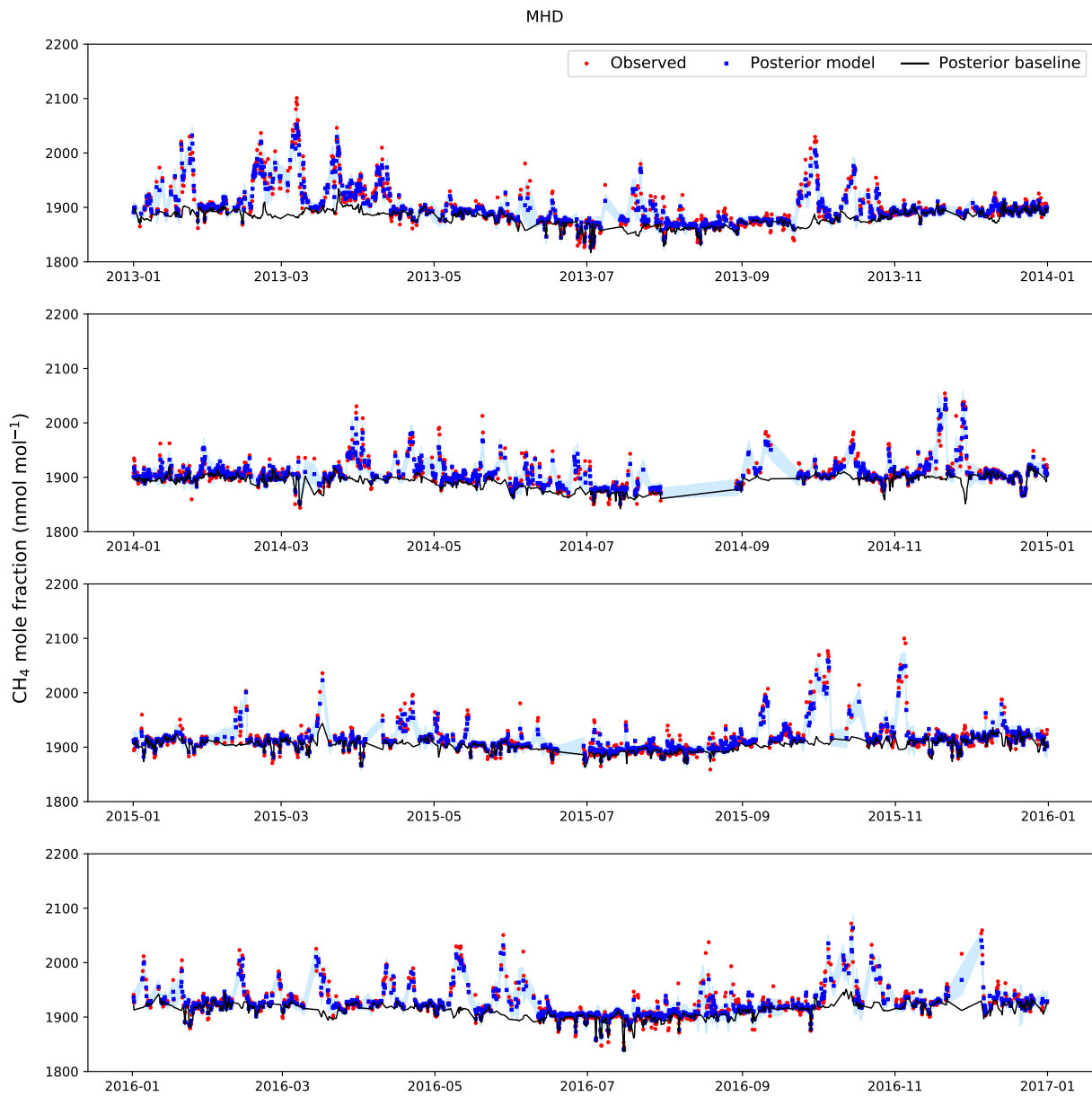


**Figure S4.** Observed (red) and modelled mole fractions (blue) at HFD between 2014–2017. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.

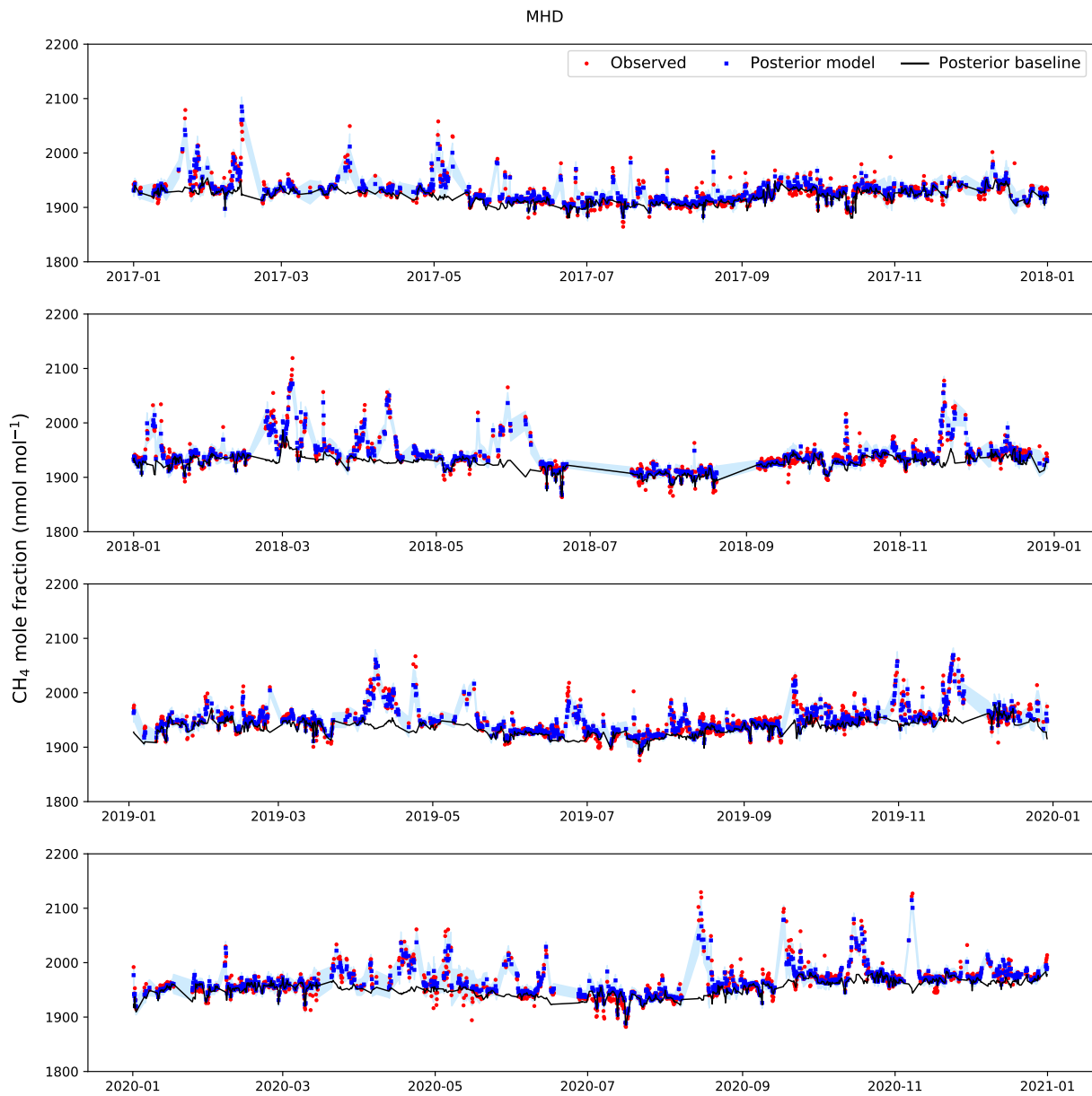
HFD



**Figure S5.** Observed (red) and modelled mole fractions (blue) at HFD between 2018–2020. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



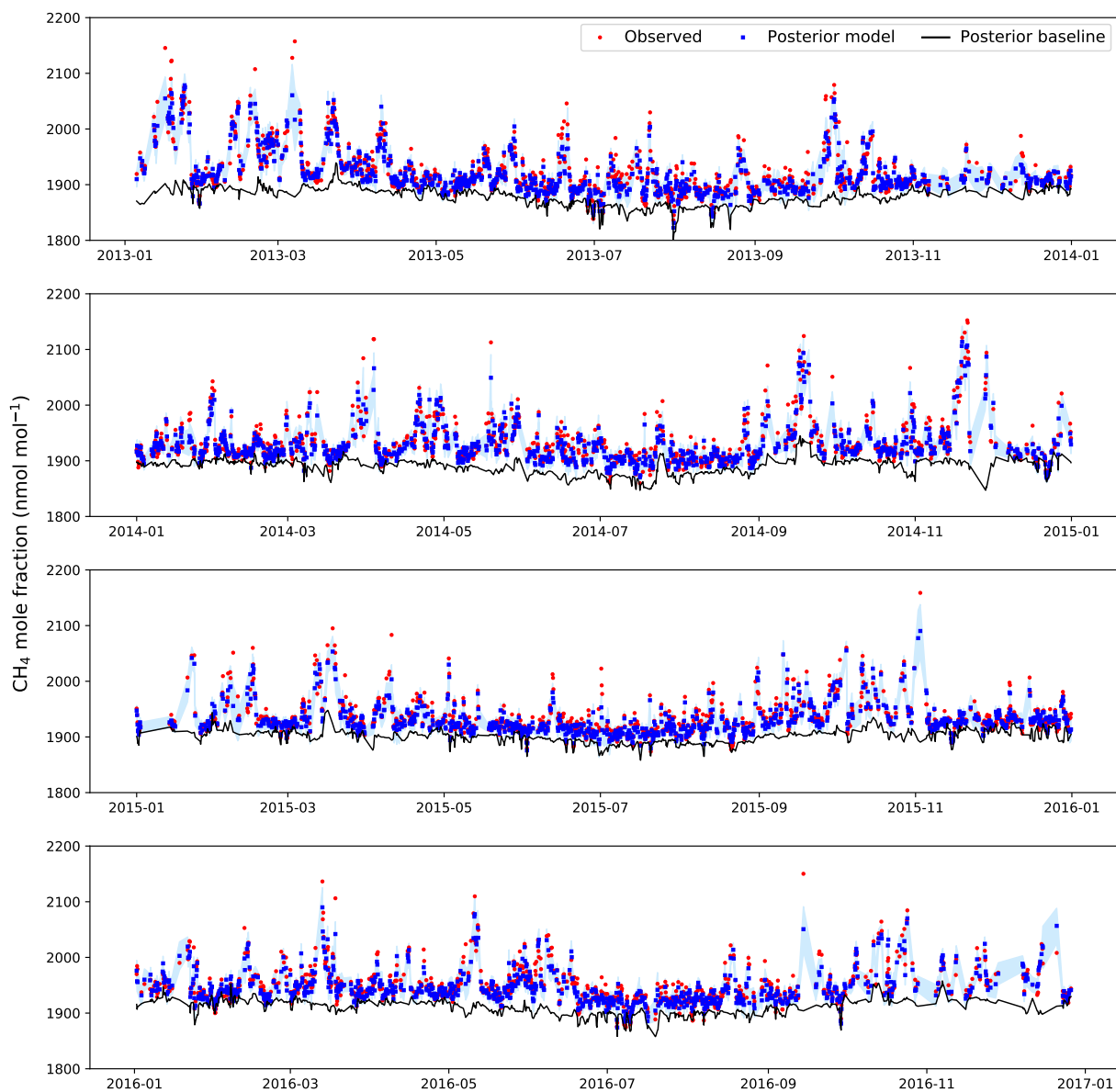
**Figure S6.** Observed (red) and modelled mole fractions (blue) at MHD between 2013–2016. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



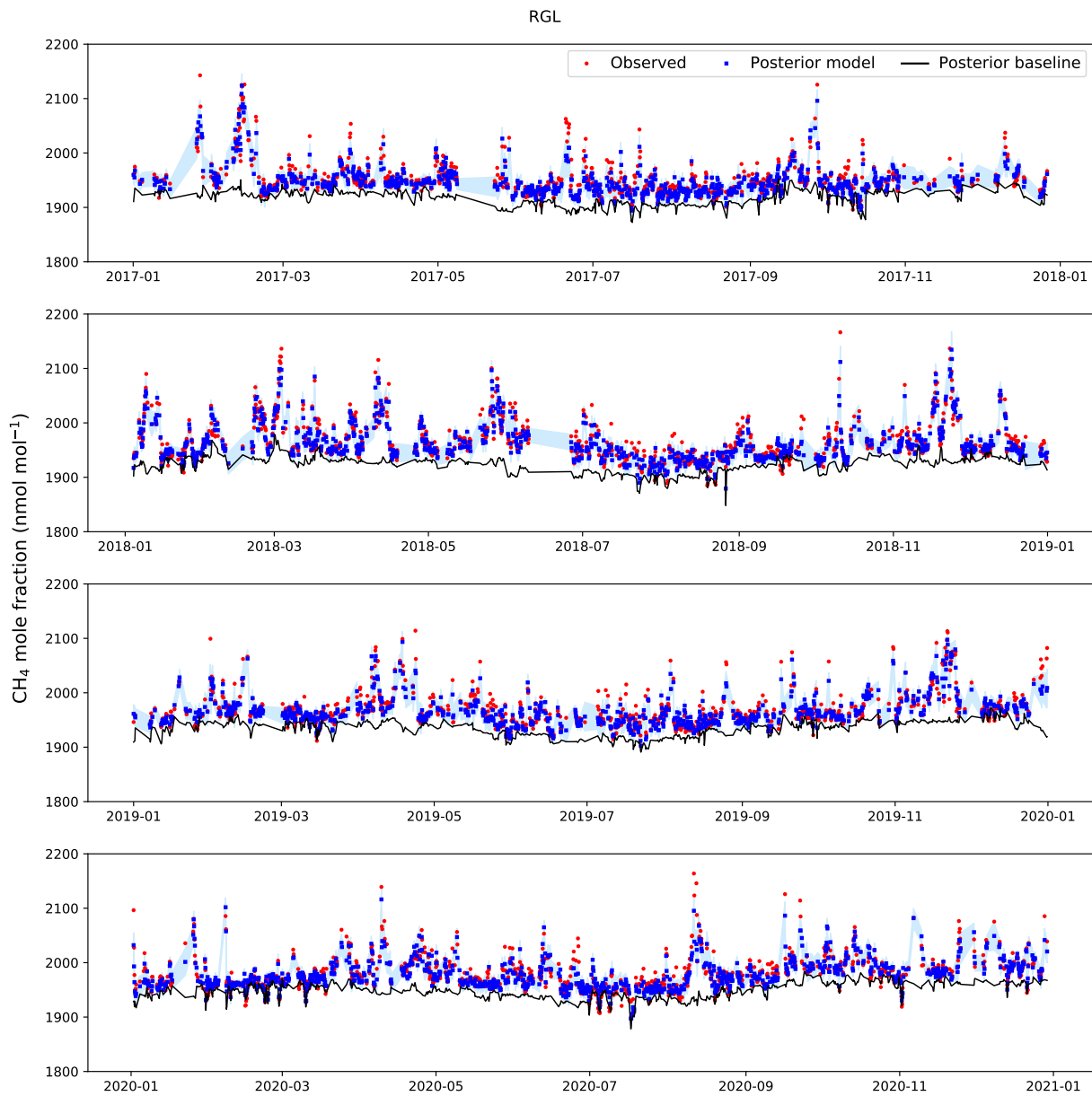
**Figure S7.** Observed (red) and modelled mole fractions (blue) at MHD between 2017–2020. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



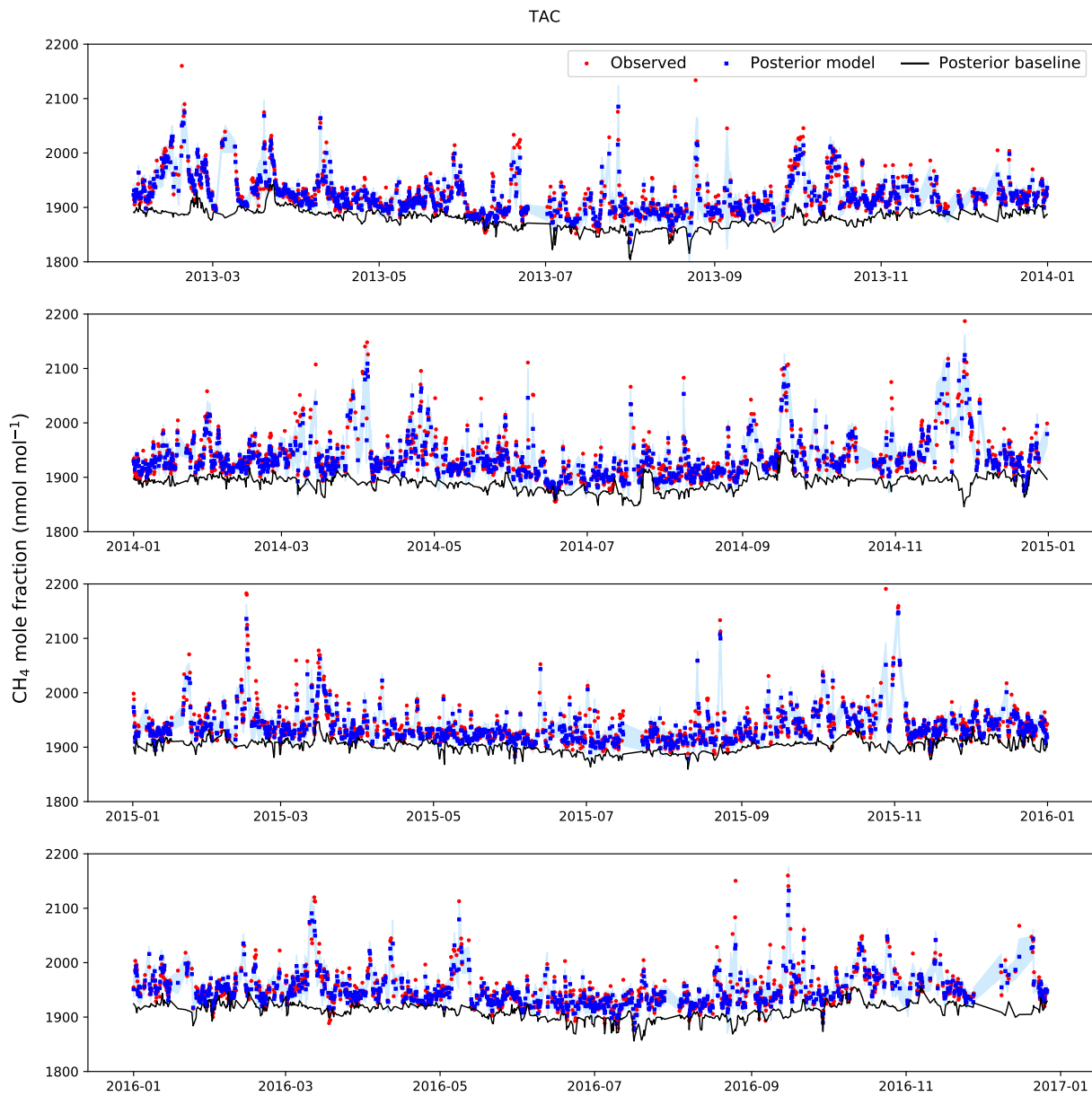
RGL



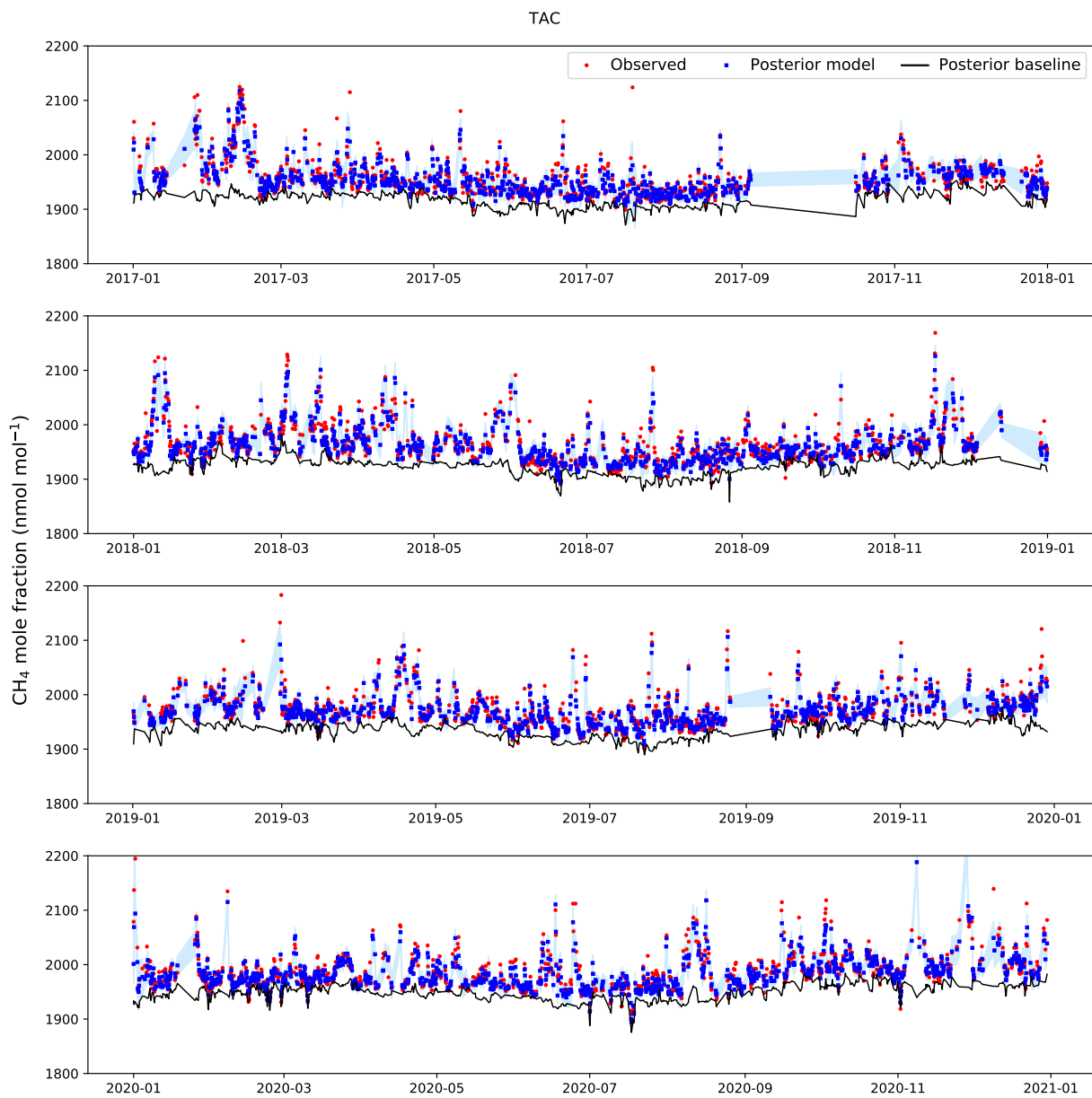
**Figure S8.** Observed (red) and modelled mole fractions (blue) at RGL between 2013–2016. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



**Figure S9.** Observed (red) and modelled mole fractions (blue) at RGL between 2017–2020. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.

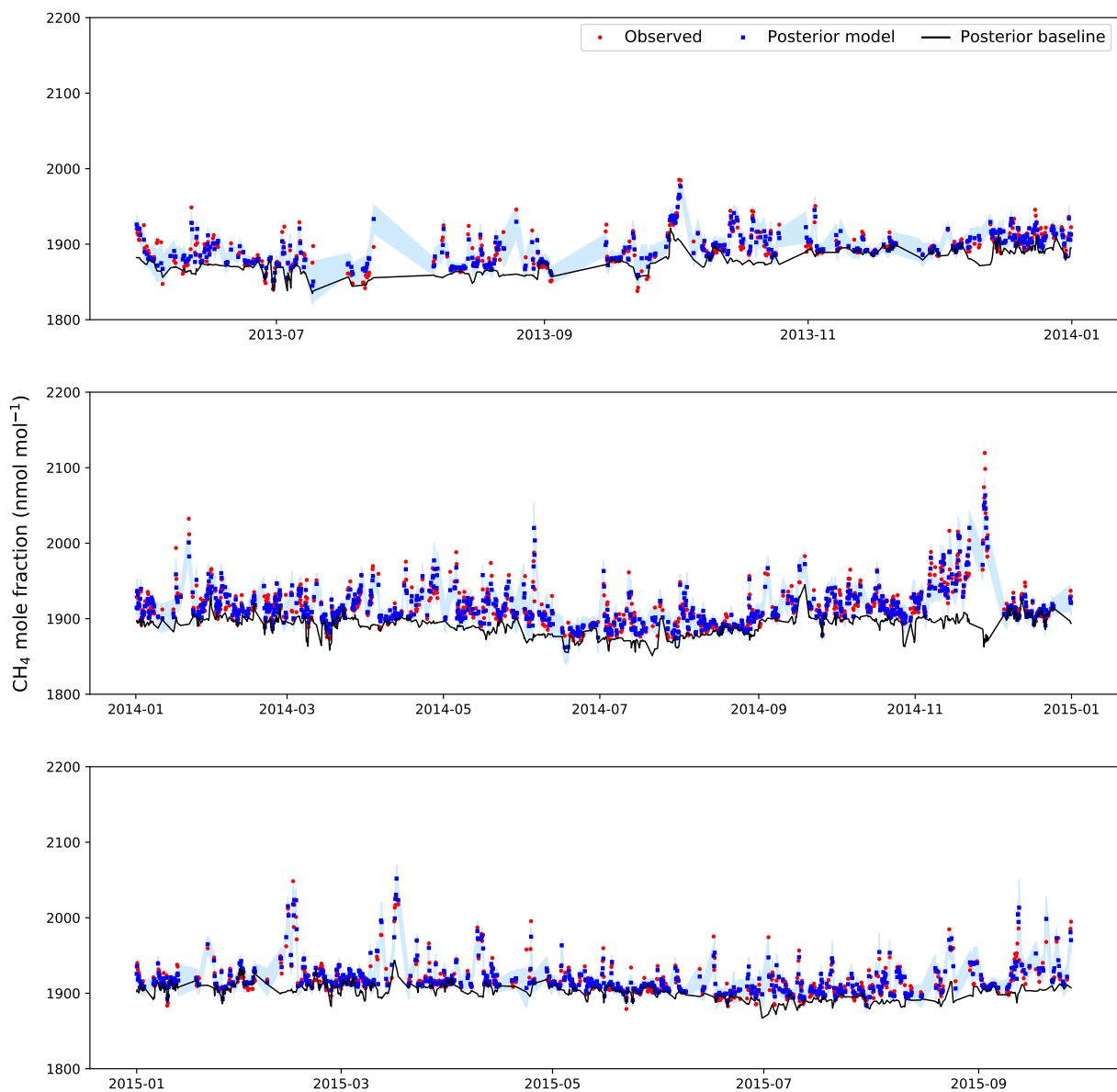


**Figure S10.** Observed (red) and modelled mole fractions (blue) at TAC between 2013–2016. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



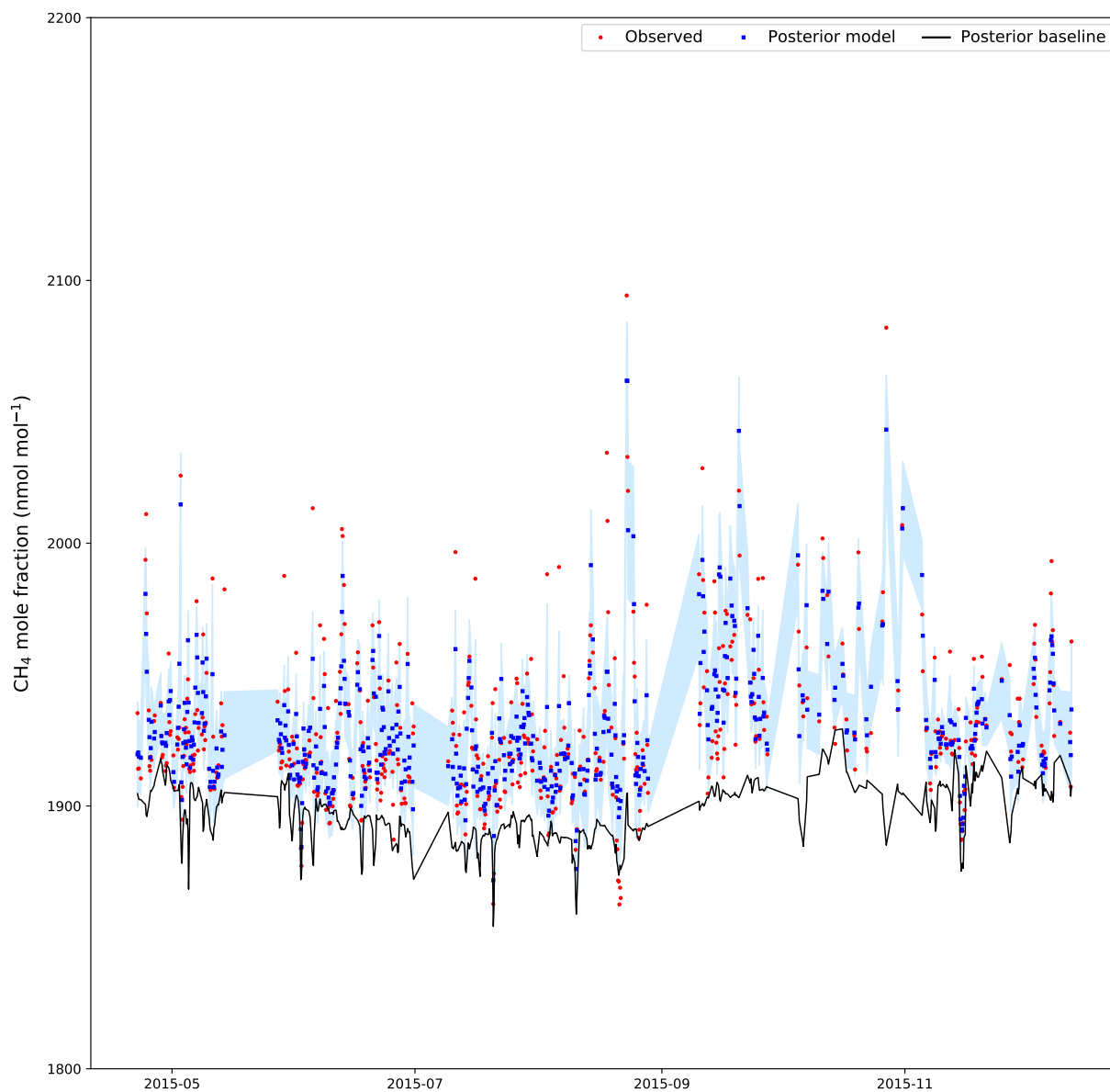
**Figure S11.** Observed (red) and modelled mole fractions (blue) at TAC between 2017–2020. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.

TTA

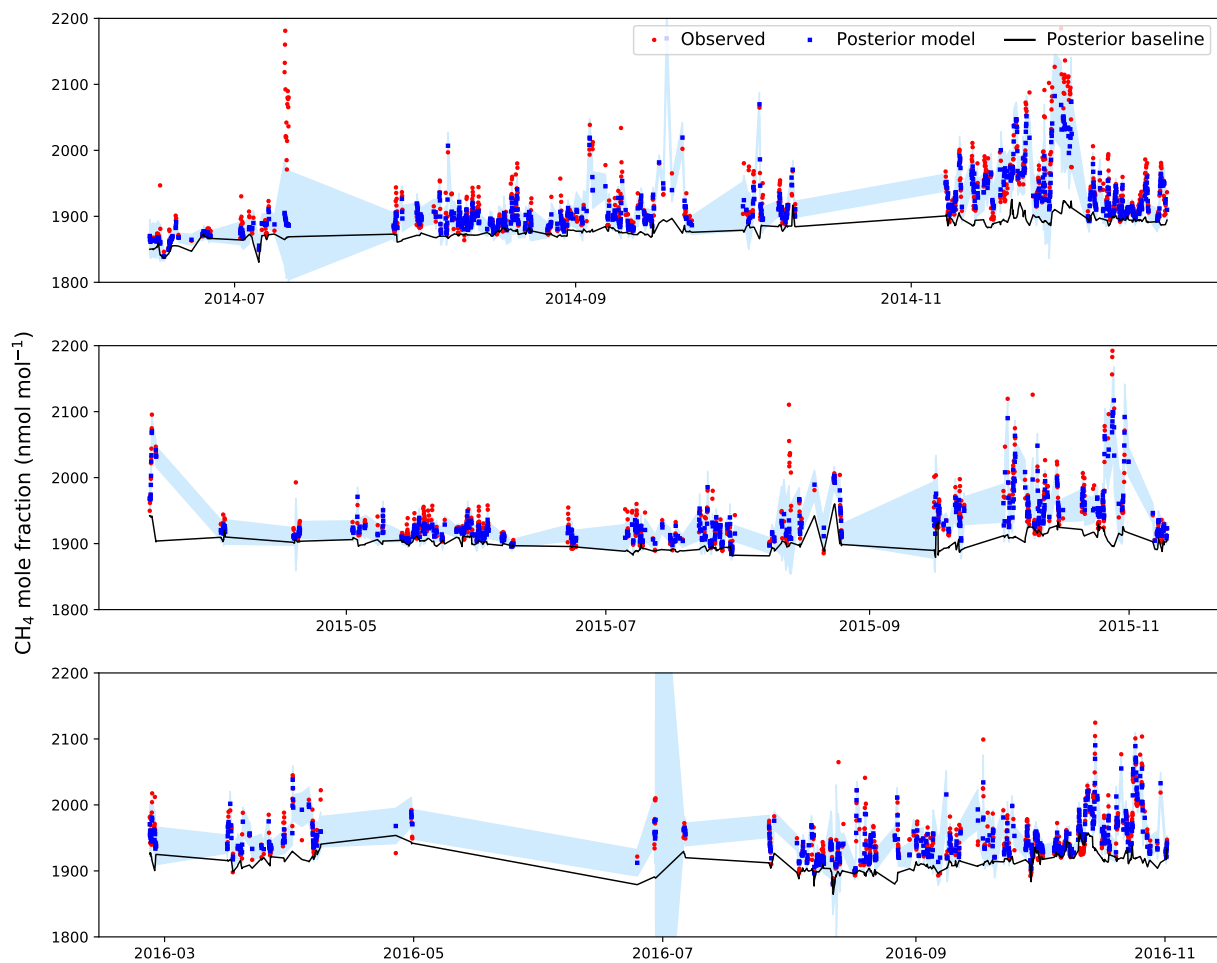


**Figure S12.** Observed (red) and modelled mole fractions (blue) at TTA between 2013–2015. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.

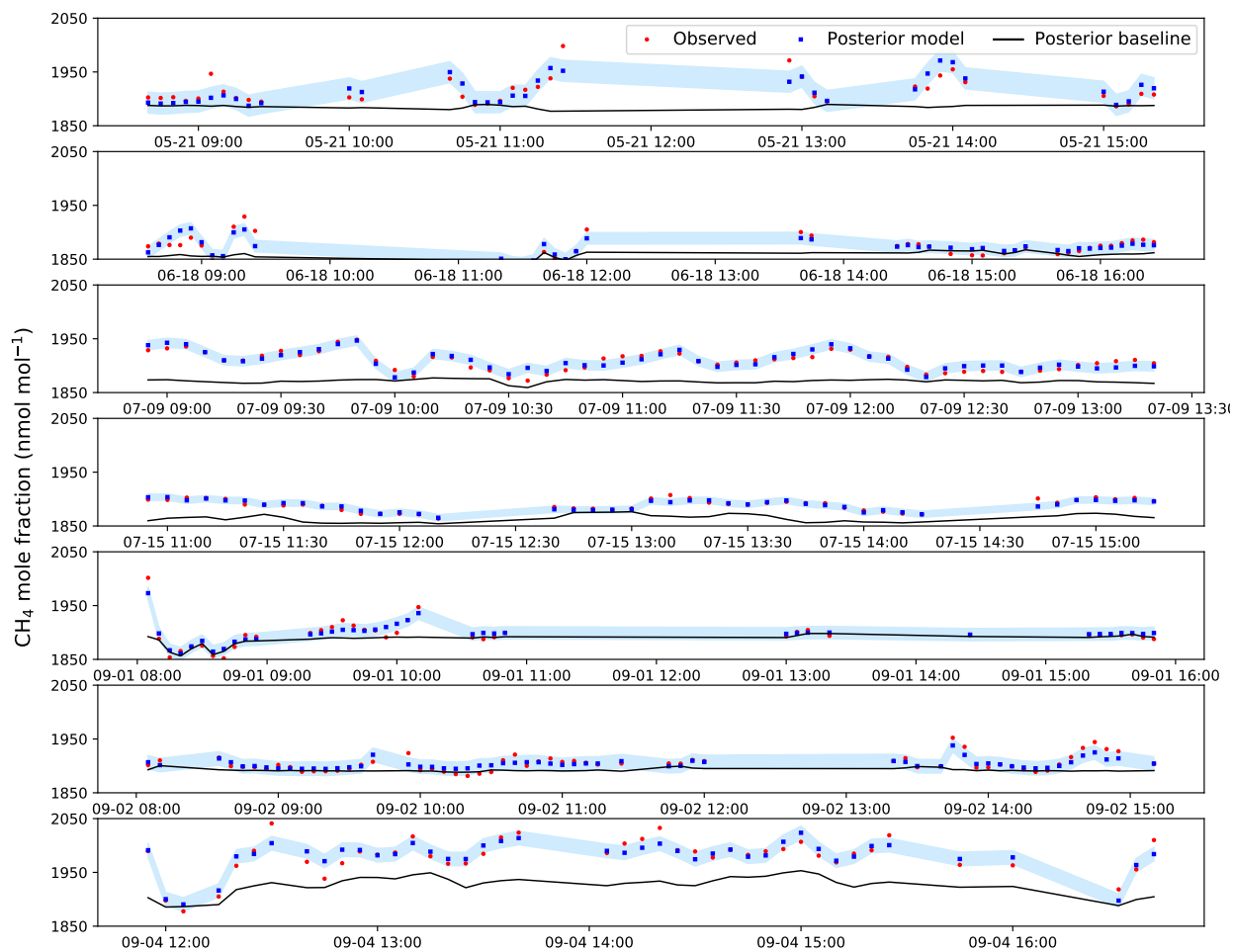
GLA



**Figure S13.** Observed (red) and modelled mole fractions (blue) at GLA during 2015. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



**Figure S14.** Observed (red) and modelled mole fractions (blue) from teh DFDS ferry between 2014–2016. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.



**Figure S15.** Observed (red) and modelled mole fractions (blue) from the FAAM aircraft during 2014. The posterior modelled baseline is shown in black. Shading represents the posterior model-measurement uncertainty.