Supplement

Fig. S1: As Fig. 1 but for 2010-2014.
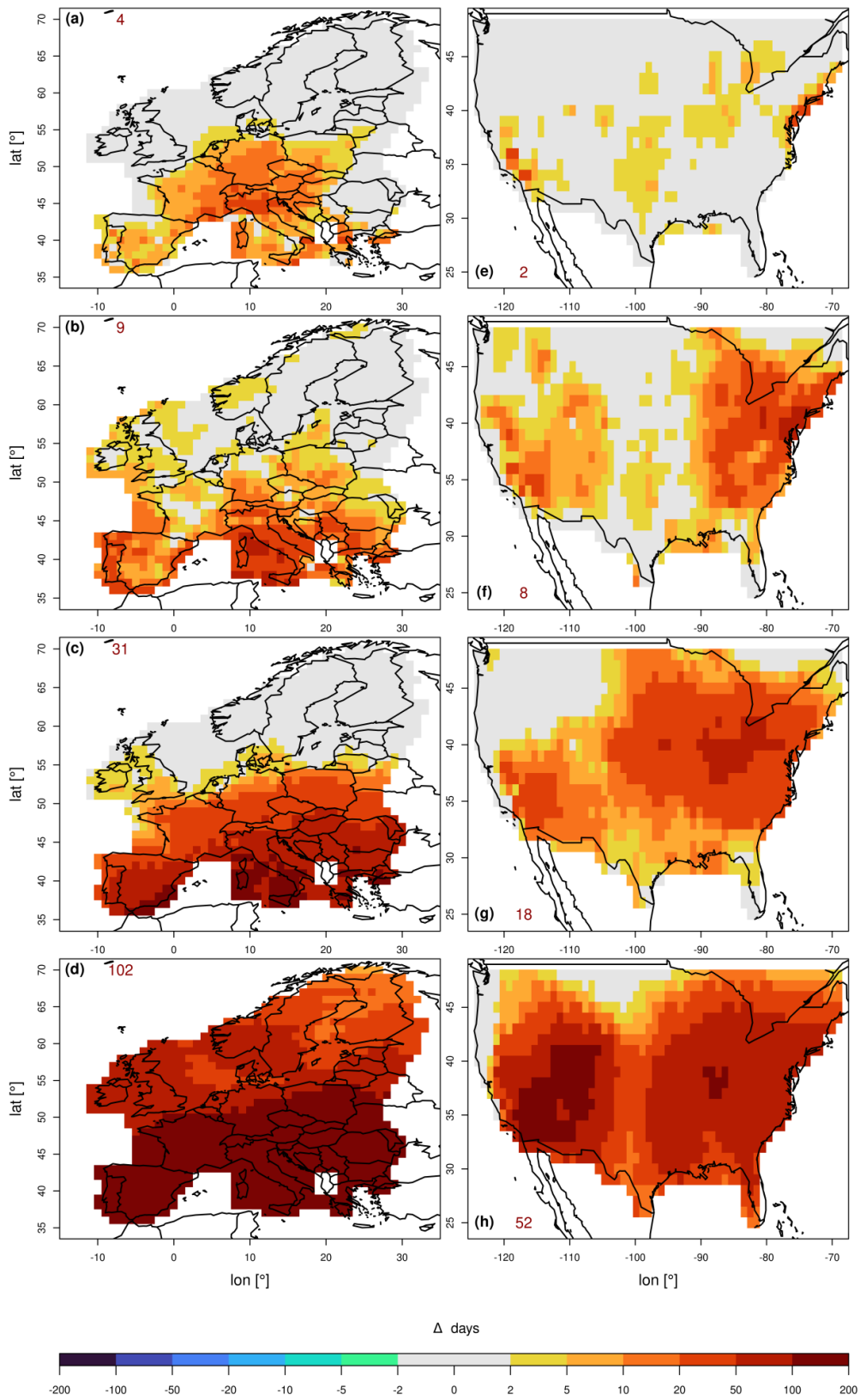
Fig. S2: As Fig. 2 but for 2010-2014.
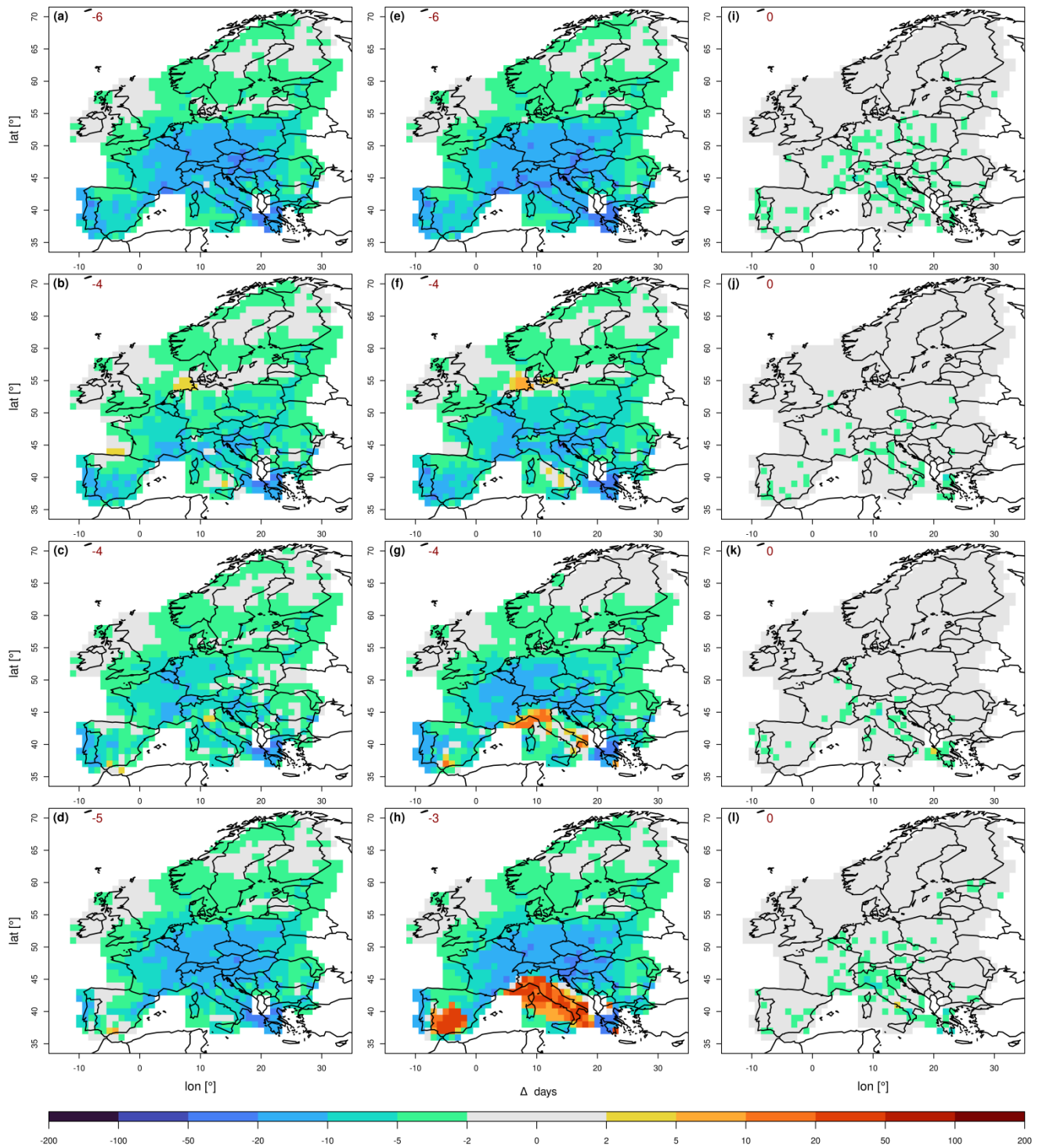
Fig. S3: Average residual bias in the number of MDA8 O$_3$ exeedance days post bias correction as obtained by different CCMs for the EU domain. All panels for the base period (2005-2009). Rows give different CCM results, EC-Earth3 (a,e,i), CESM2-WACCM6 (b,f,j), GFDL-ESM4 (c,g,k) and UKESM1-0-LL (d,h,l), while columns give different correction methods MB (left), RB (middle) and QM (right). Red numbers in the upper/lower left corner indicate the grid cell residual bias. Grey shading indicates differences within ± 2 exceedance days.
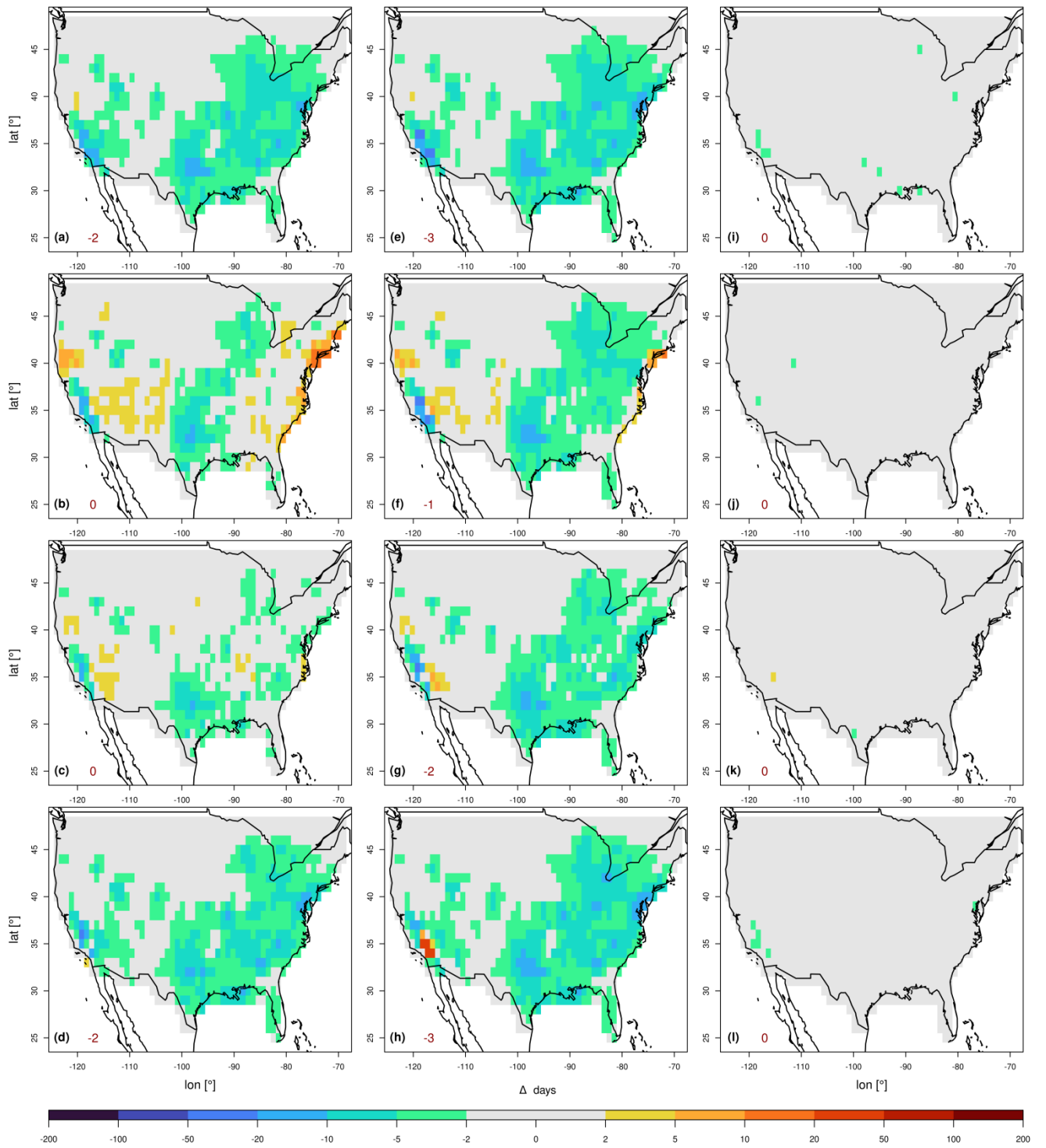
Fig. S4: As Fig. S3 but for the US domain.
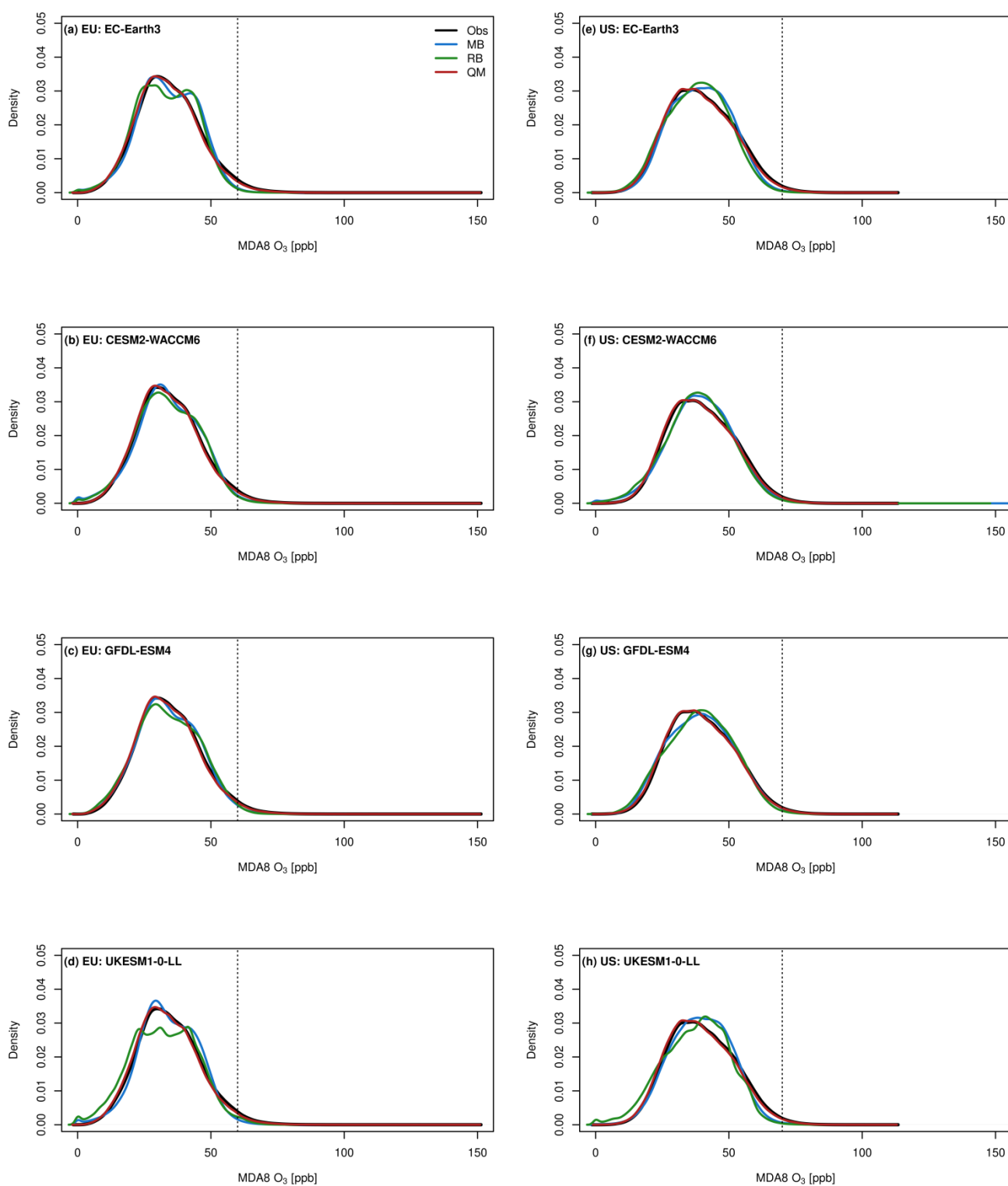
Fig. S5: Probability density function (PDF) of observed (black) and bias corrected model (coloured) MDA8 O_3 during 2005 to 2009 in the EU (a-d) and US (e-h) domain (EC-Earth3 a & e, CESM2-WACCM6 b & f, GFDL-ESM4 c & g and UKESM1-0-LL d & h). Dashed vertical lines indicate the target value for the protection of human health.
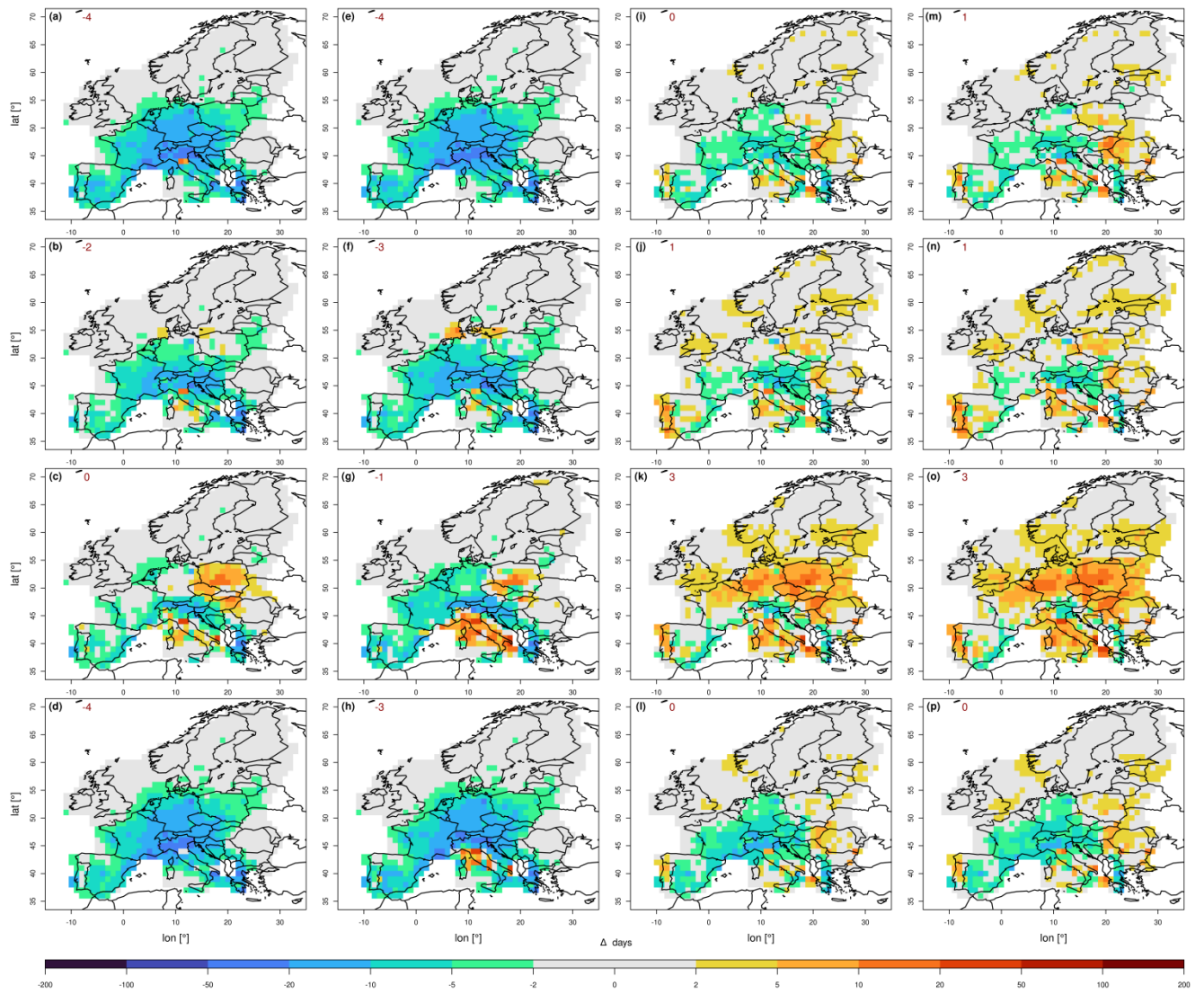
Fig. S6: As Fig. S3 but for 2010-2014. Note the columns show individual correction techniques: MB (1st column), RB (2nd column), DC (3rd column) and QM (4th column).
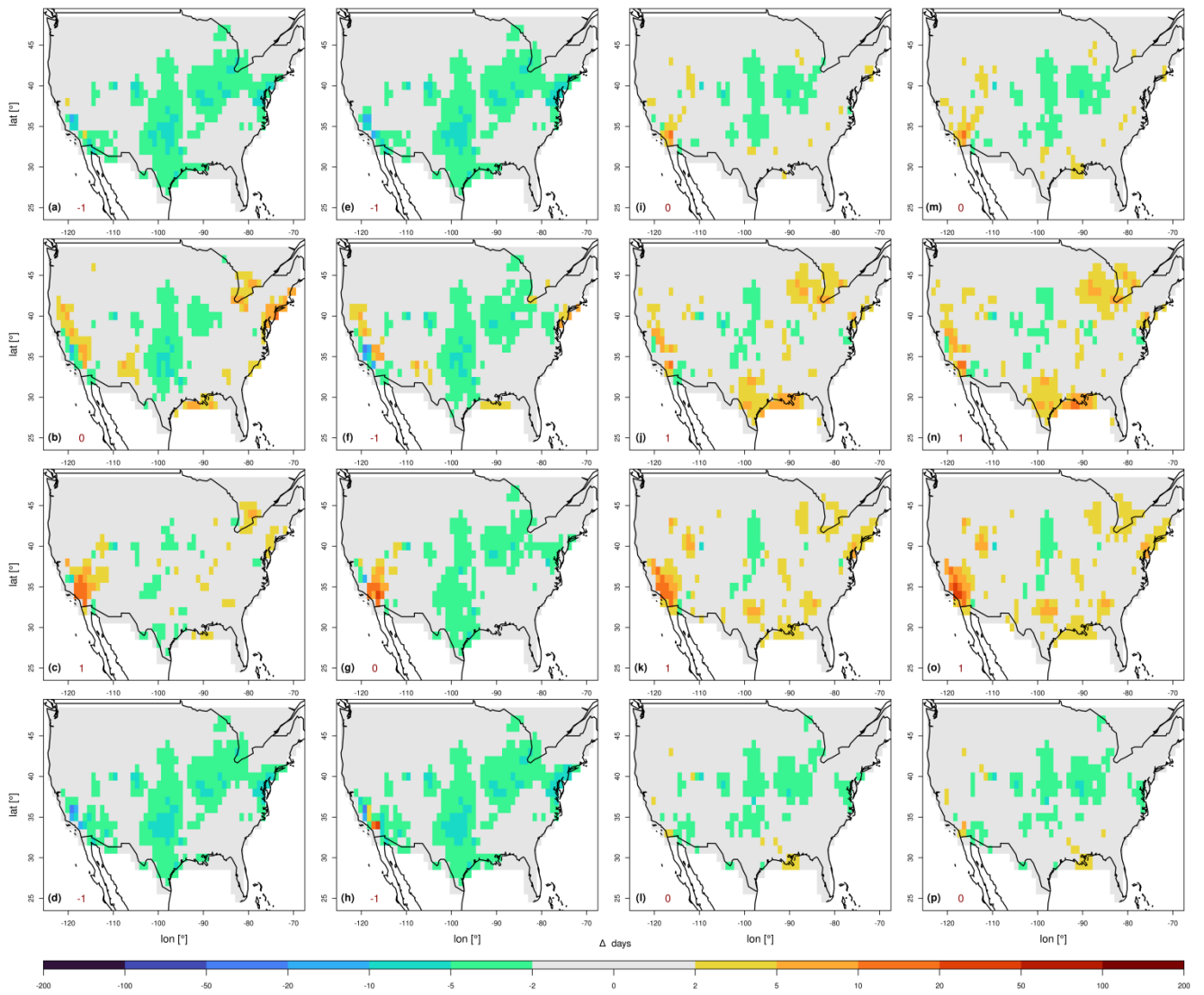
Fig. S7: As Fig. S6 but for the US domain.
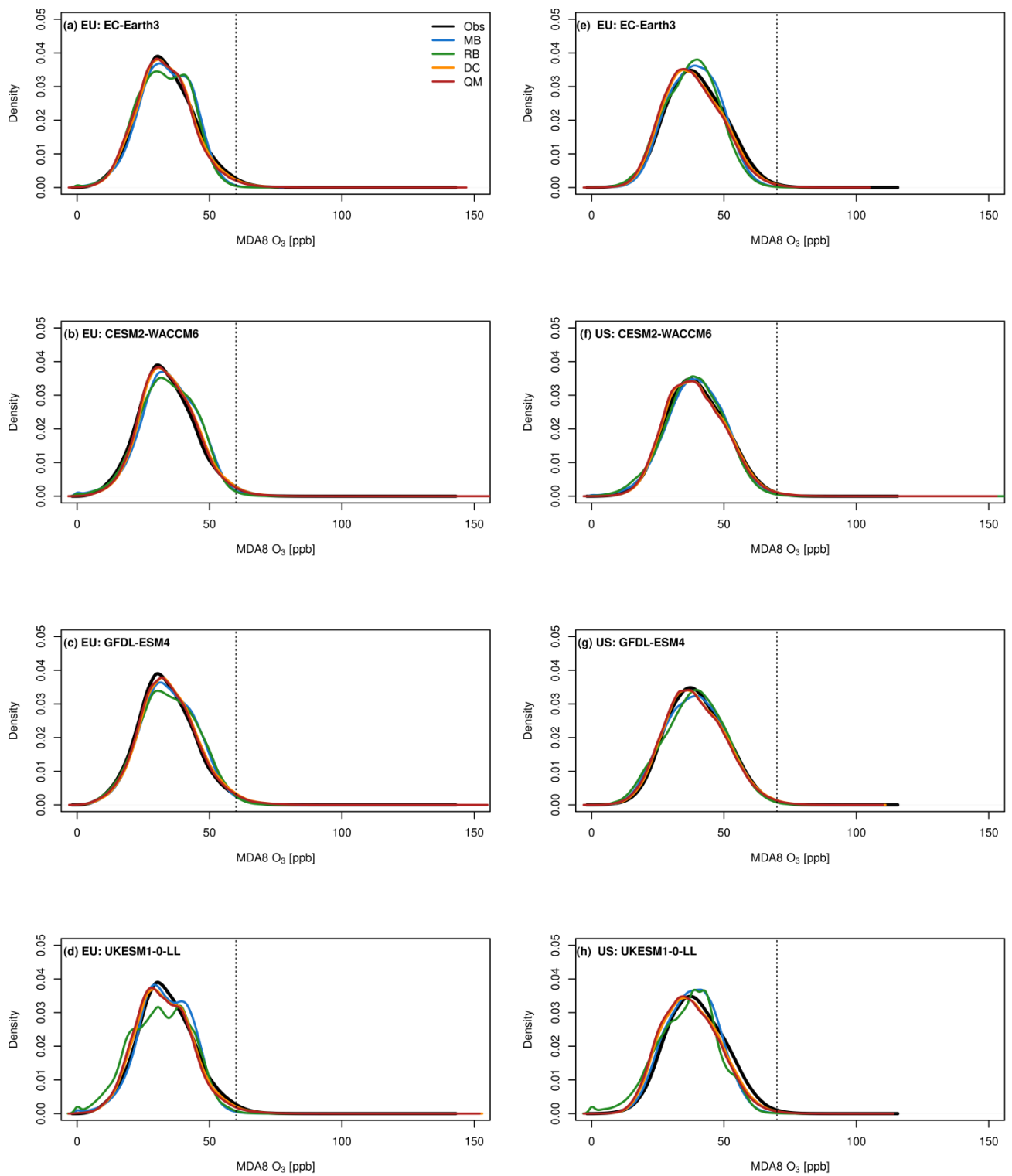
Fig. S8: As Fig. S5 but for 2010-2014.
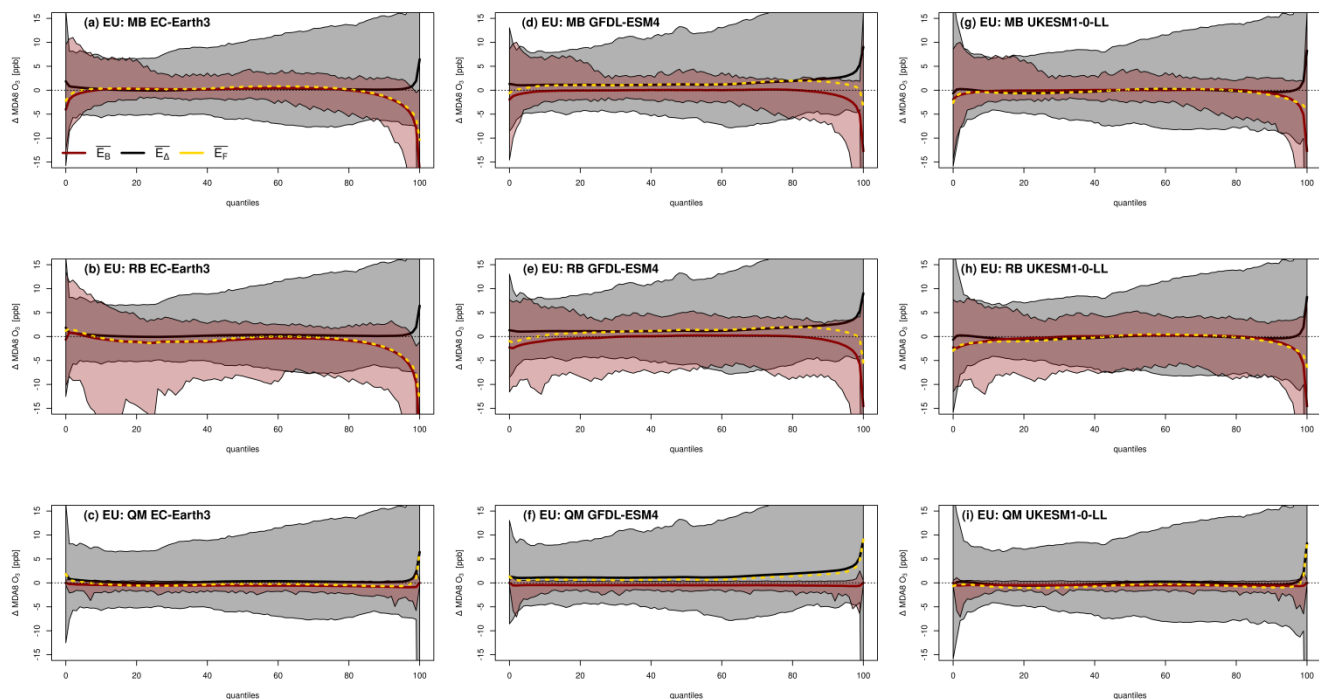
Fig. S9: As Fig. 5 but for the EC-Earth3 (left column), GFDL-ESM4 (middle column) and UKESM1-0-LL (right column) models during the evaluation period, for the MB (a & d), RB (b & e) and DC/QM (c & f) methods, in the EU domain.
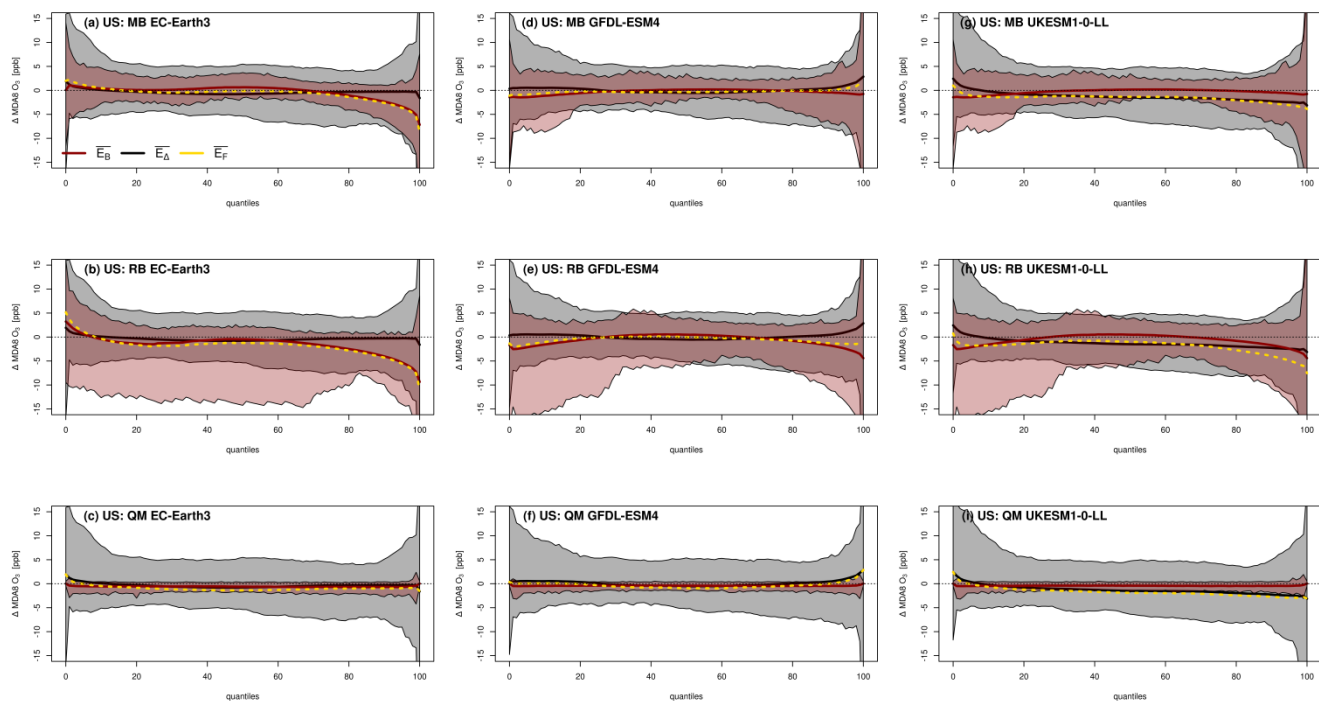
Fig. S10: As Fig. S9 but for the US domain.
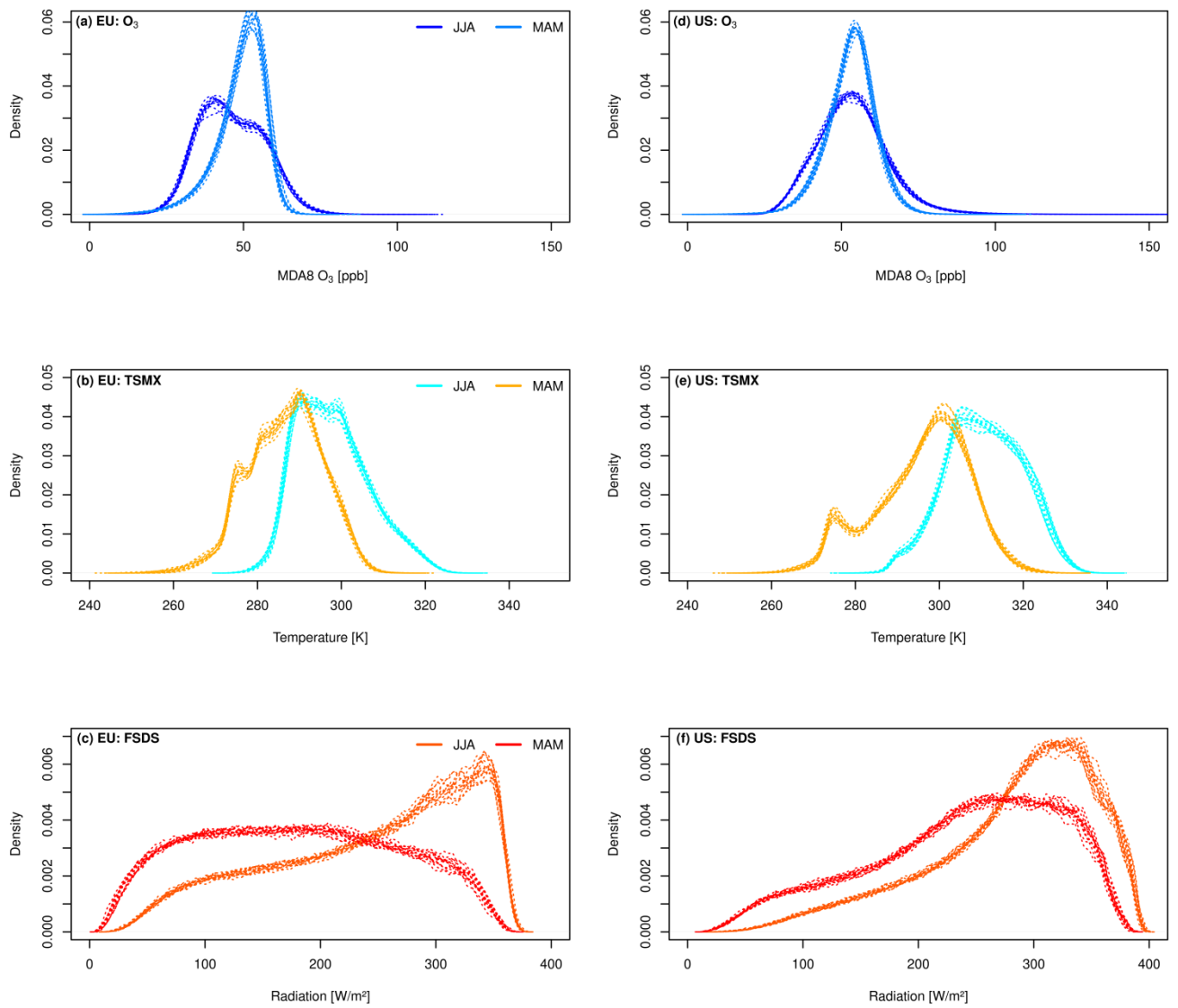
Fig. S11: As Fig. 6 but for 2010-2014.