



Supplement of

Divergent future drought projections in UK river flows and groundwater levels

Simon Parry et al.

Correspondence to: Jamie Hannaford (jaha@ceh.ac.uk)

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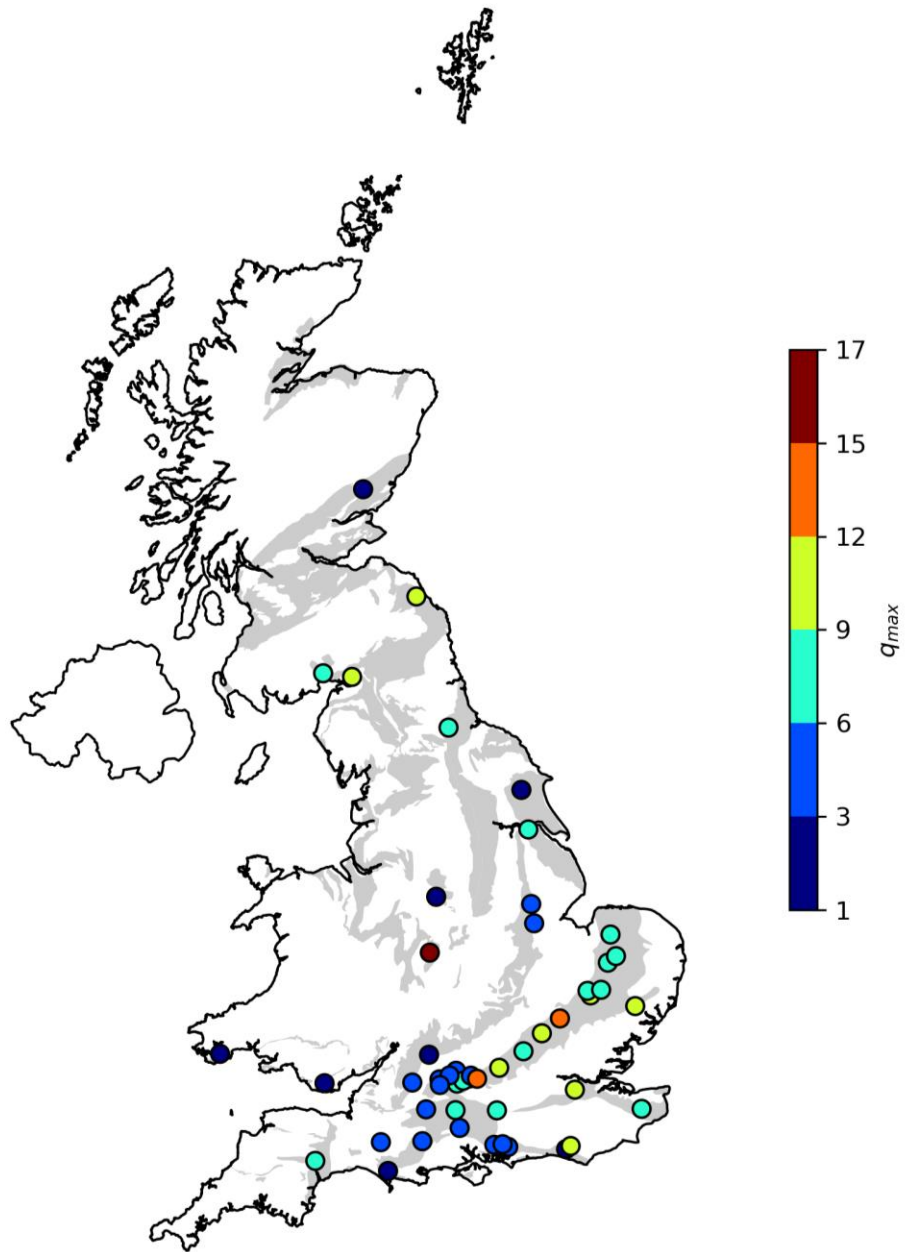


Figure S1 -- q_{max} calculated for each of the 51 boreholes.

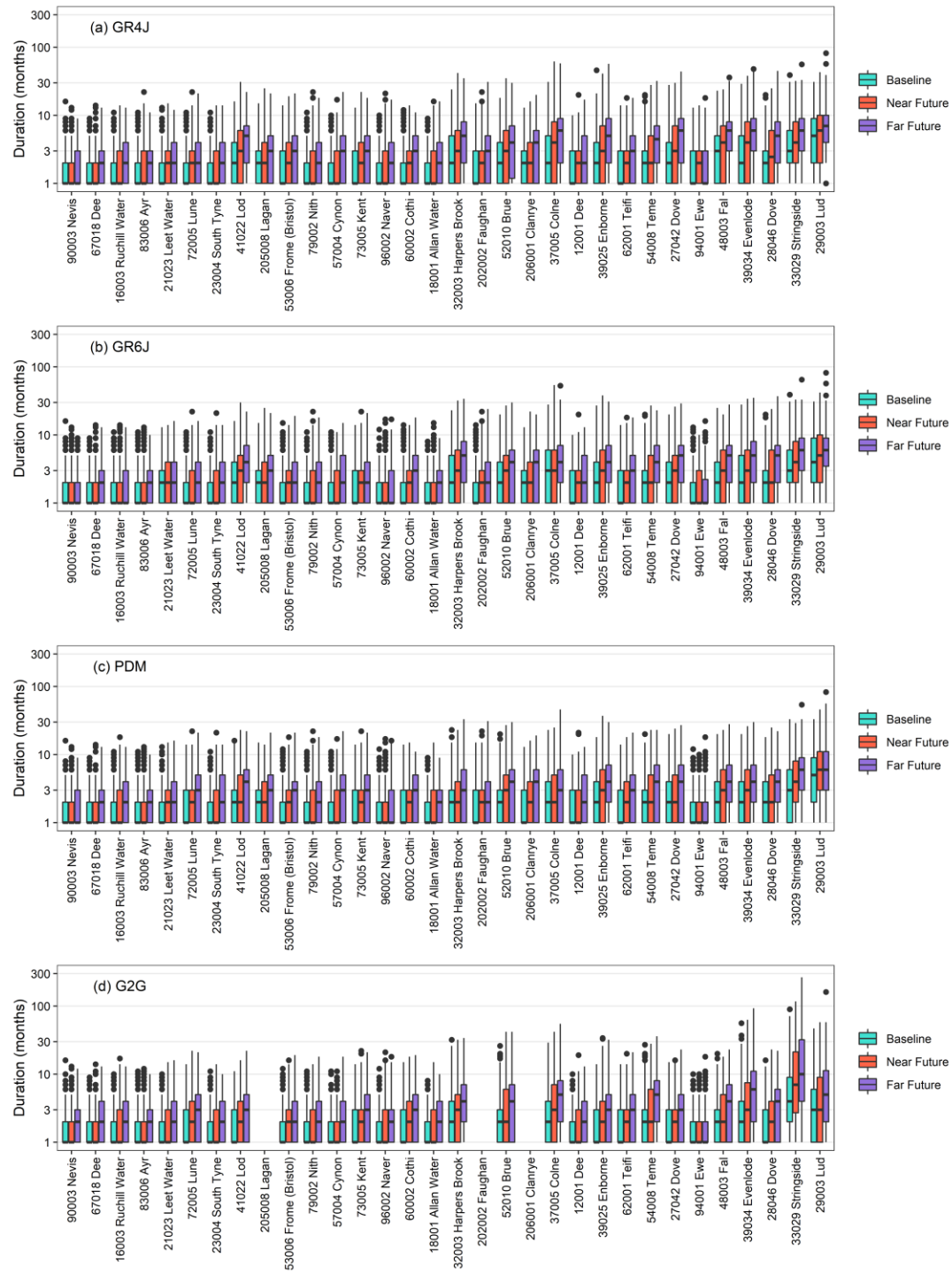


Figure S2 -- Duration of droughts in the baseline and future simrcm for 32 catchments. Boxplots contain durations of all drought events in the baseline (1989-2018), near future (2020-2049) and far future (2050-2079) time slices across all 12 simrcm runs. Results for the four hydrological models are presented: (a) GR4J; (b) GR6J; (c) PDM; (d) G2G. The catchments along the x-axis are ordered from lowest (left) to highest (right) Base Flow Index. The three catchments in Northern Ireland (202002, 205008, 206001) are not plotted for G2G (d) because Northern Ireland is not modelled by G2G. Note that the scale of the y-axis is logarithmic.

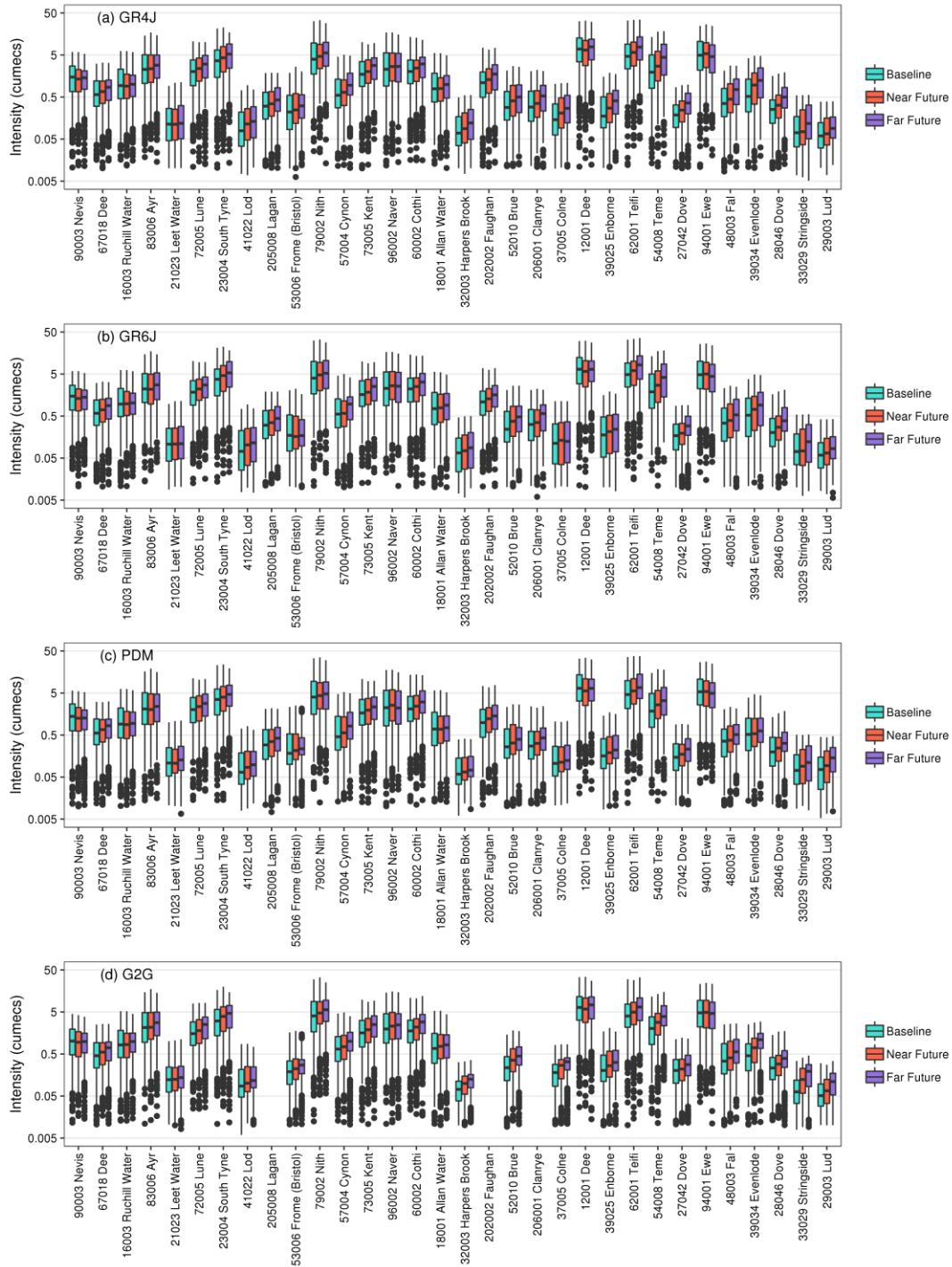


Figure S3 -- As for Figure S2, but for the intensity of drought events.

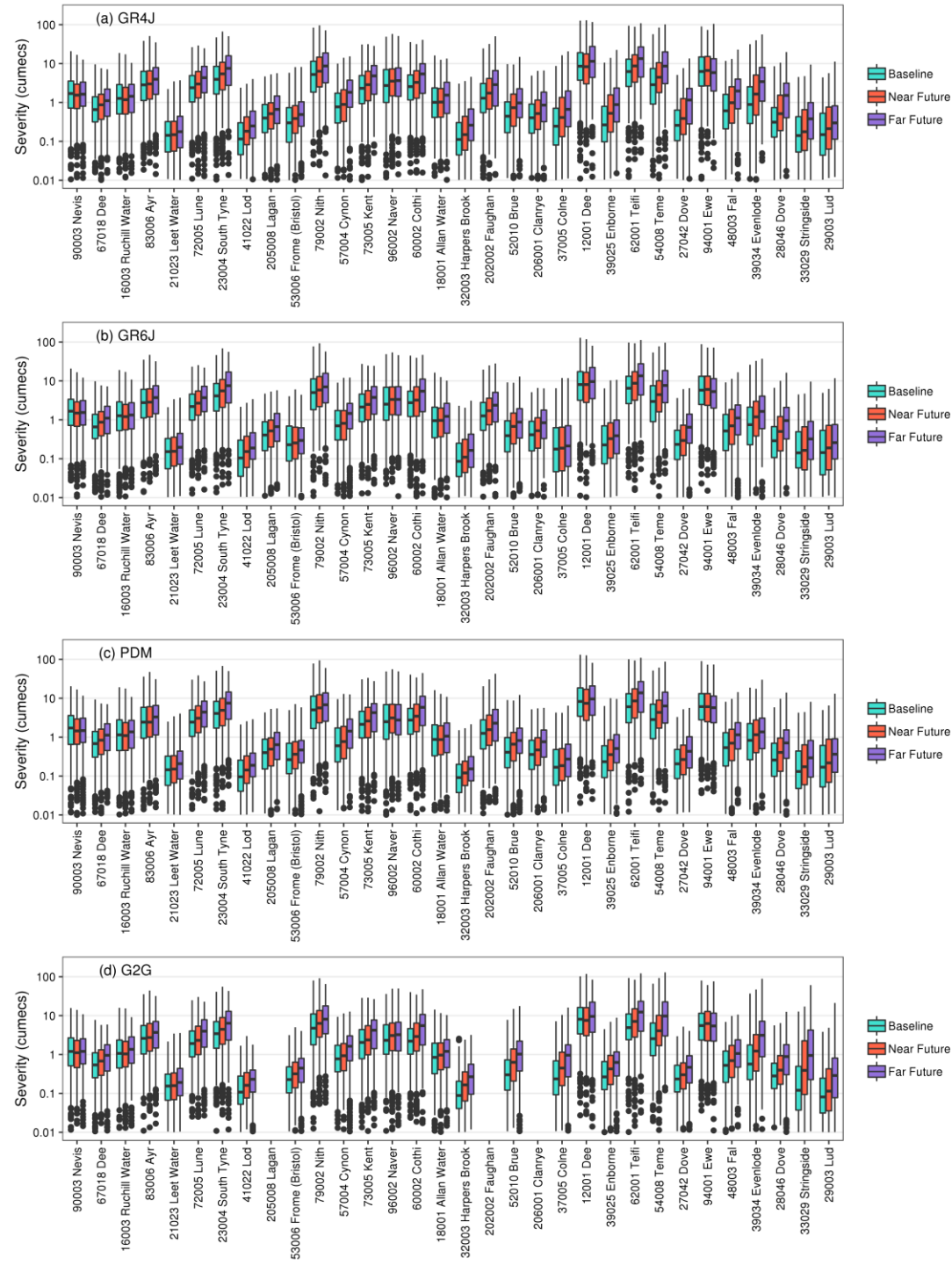


Figure S4 -- As for Figures S2 and S3, but for the severity of drought events.

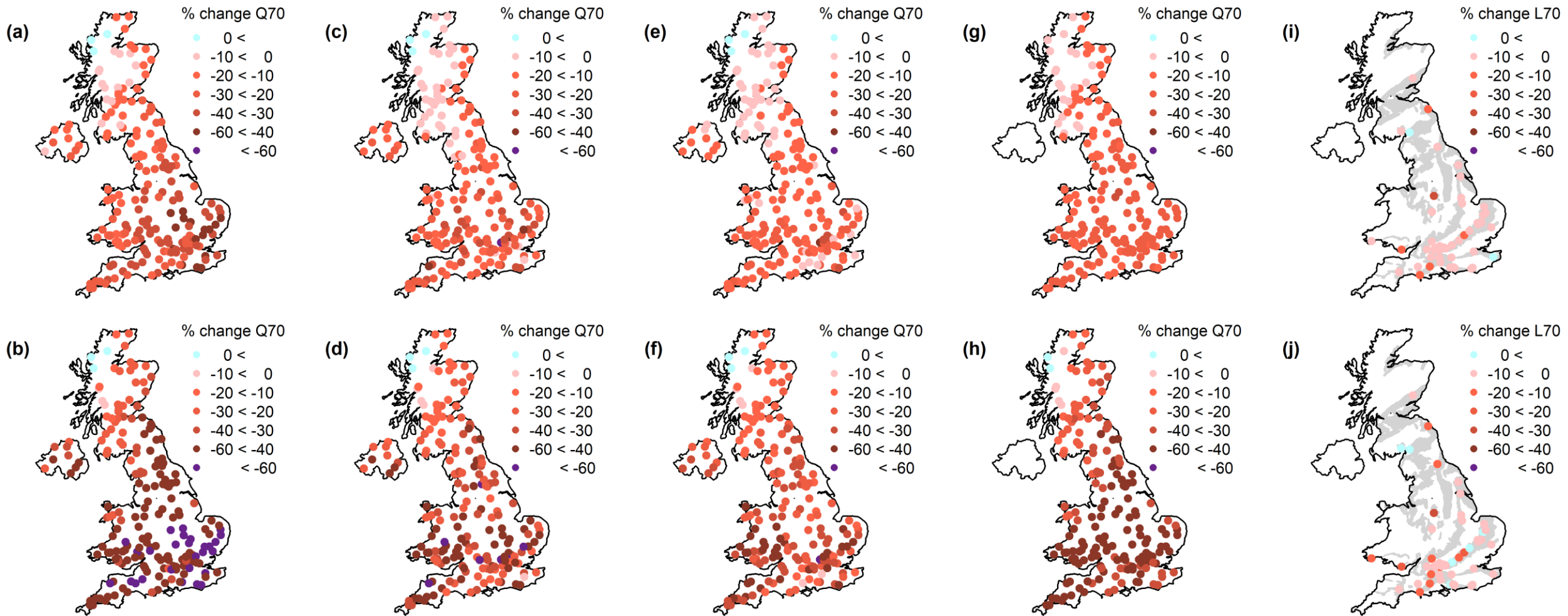


Figure S5 -- Percent change in simrcm median Q70 river flows and L70 groundwater levels in the near future (2020-2049; top row) and far future (2050-2079; bottom row), expressed relative to baseline (1989-2018) Q70 or L70, for each of the hydrological and hydrogeological models: (a-b) GR4J; (c-d) GR6J; (e-f) PDM; (g-h) G2G; (i-j) AquiMod.

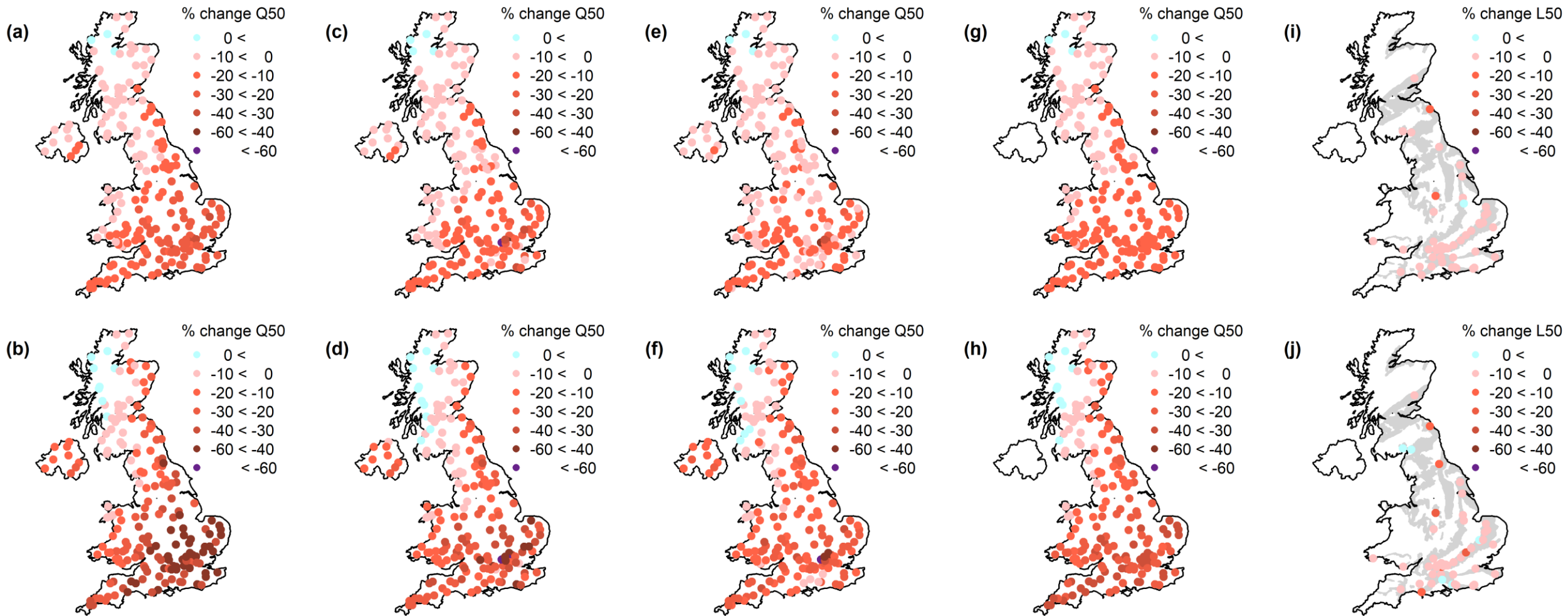


Figure S6 -- Percent change in simrcm median Q50 river flows and L50 groundwater levels in the near future (2020-2049; top row) and far future (2050-2079; bottom row), expressed relative to baseline (1989-2018) Q50 or L50, for each of the hydrological and hydrogeological models: (a-b) GR4J; (c-d) GR6J; (e-f) PDM; (g-h) G2G; (i-j) AquMod.

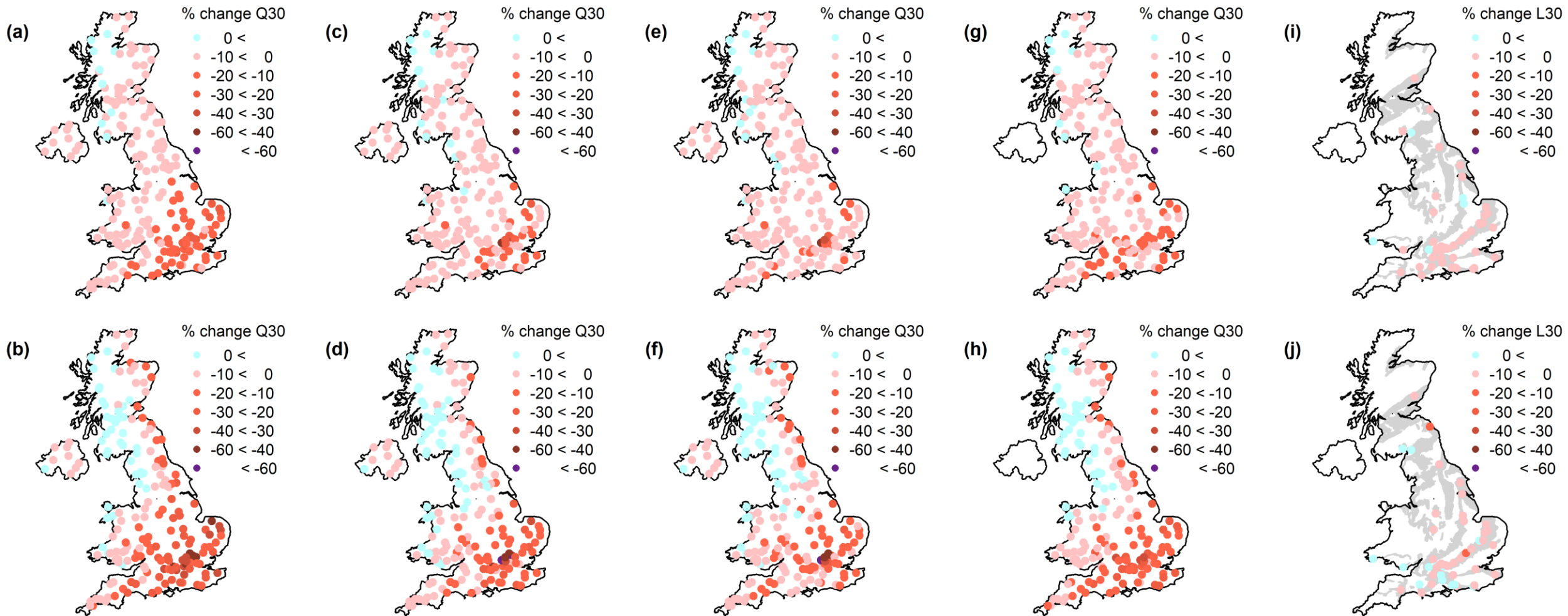


Figure S7 -- Percent change in simrcm median Q30 river flows and L30 groundwater levels in the near future (2020-2049; top row) and far future (2050-2079; bottom row), expressed relative to baseline (1989-2018) Q30 or L30, for each of the hydrological and hydrogeological models: (a-b) GR4J; (c-d) GR6J; (e-f) PDM; (g-h) G2G; (i-j) AquiMod.

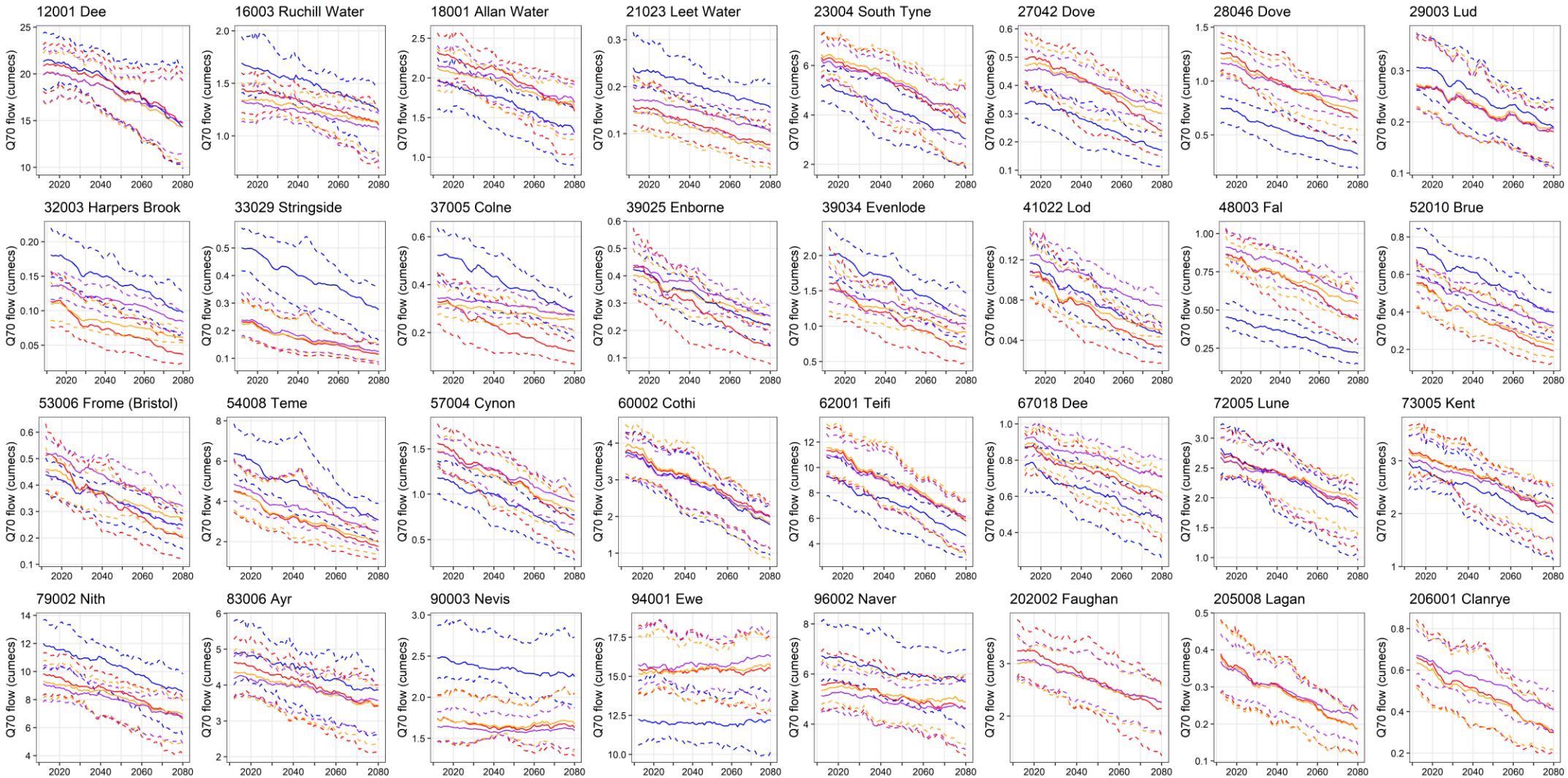


Figure S8 -- The 70% exceedance flow (Q70; cumecs) over transient 30-year time slices in simrcm data, 1983-2080. Q70 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. simrcm median and maxima or minima calculated over the 12 simrcm runs are indicated by solid and dashed lines, respectively. Results for the four different hydrological models are indicated by colour-coding (GR4J in red; GR6J in orange; PDM in purple; G2G in blue), and are presented for 32 catchments. Note that G2G is not plotted for the three catchments in Northern Ireland (202002, 205008, 206001) because Northern Ireland is not modelled by G2G.

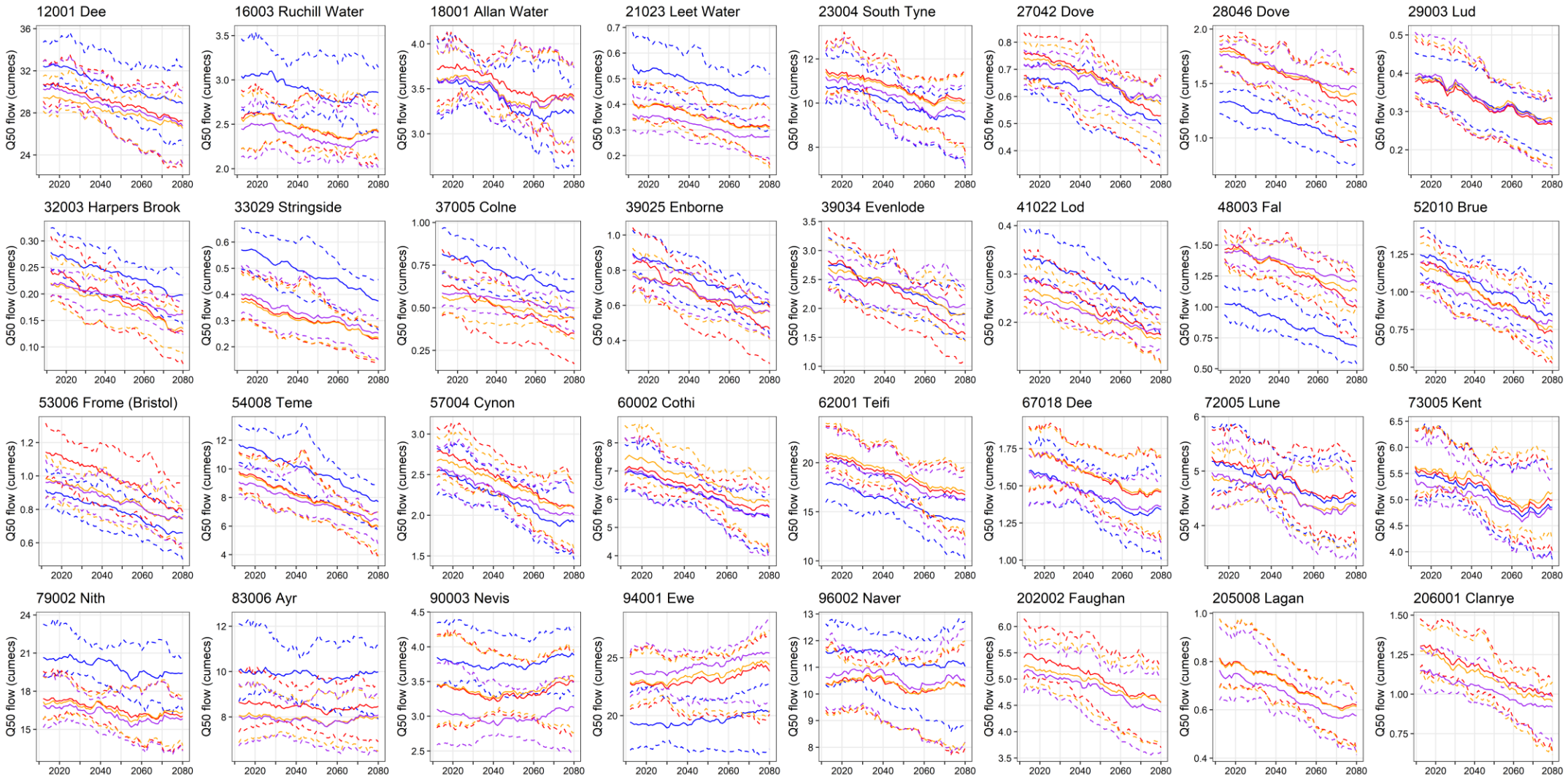


Figure S9 -- The 50% exceedance flow (Q50; cumecs) over transient 30-year time slices in simrcm data, 1983-2080. Q50 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. simrcm median and maxima or minima calculated over the 12 simrcm runs are indicated by solid and dashed lines, respectively. Results for the four different hydrological models are indicated by colour-coding (GR4J in red; GR6J in orange; PDM in purple; G2G in blue), and are presented for 32 catchments. Note that G2G is not plotted for the three catchments in Northern Ireland (202002, 205008, 206001) because Northern Ireland is not modelled by G2G.

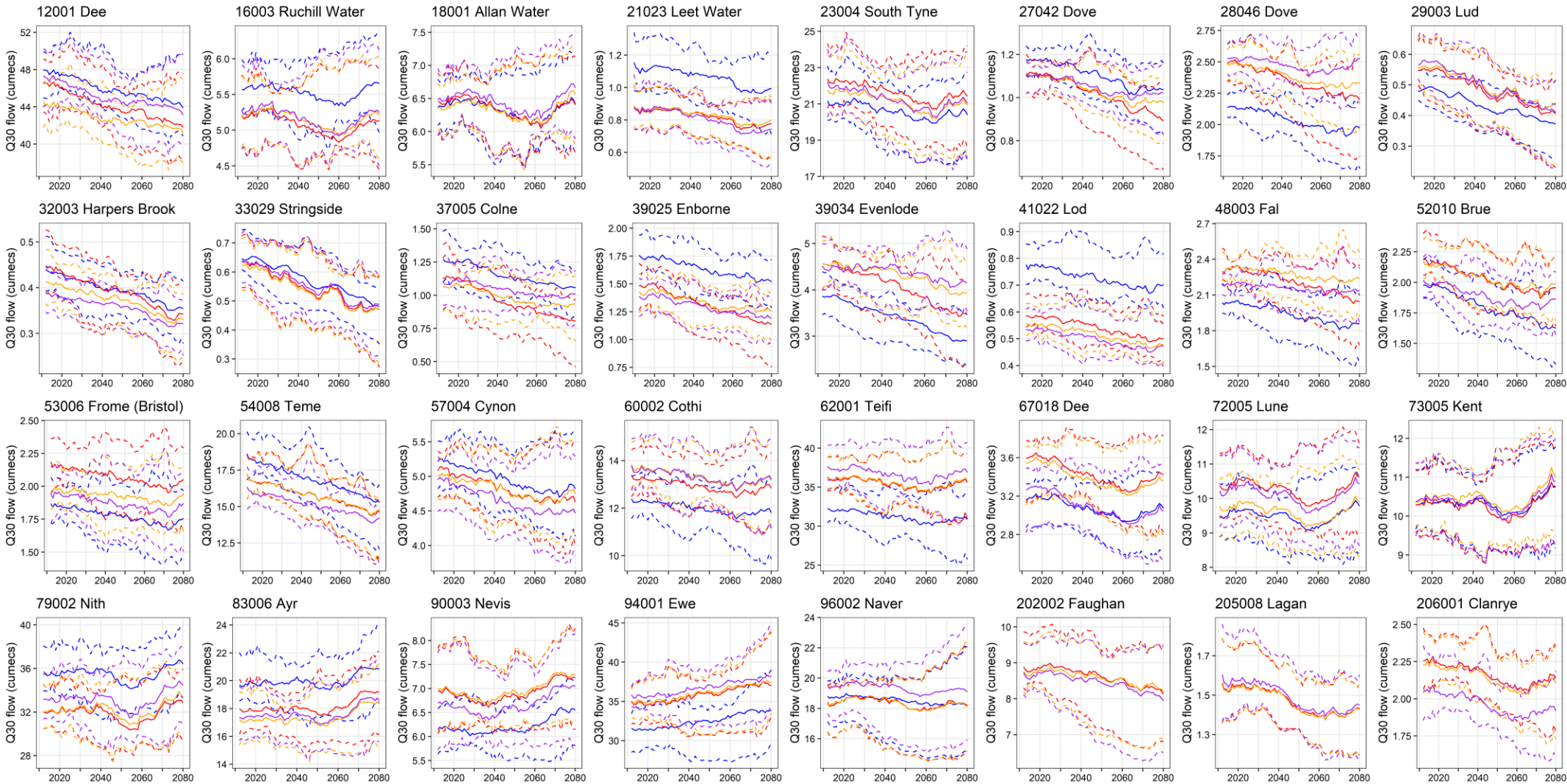


Figure S10 -- The 30% exceedance flow (Q30; cumecs) over transient 30-year time slices in simrcm data, 1983-2080. Q30 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. simrcm median and maxima or minima calculated over the 12 simrcm runs are indicated by solid and dashed lines, respectively. Results for the four different hydrological models are indicated by colour-coding (GR4J in red; GR6J in orange; PDM in purple; G2G in blue), and are presented for 32 catchments. Note that G2G is not plotted for the three catchments in Northern Ireland (202002, 205008, 206001) because Northern Ireland is not modelled by G2G.

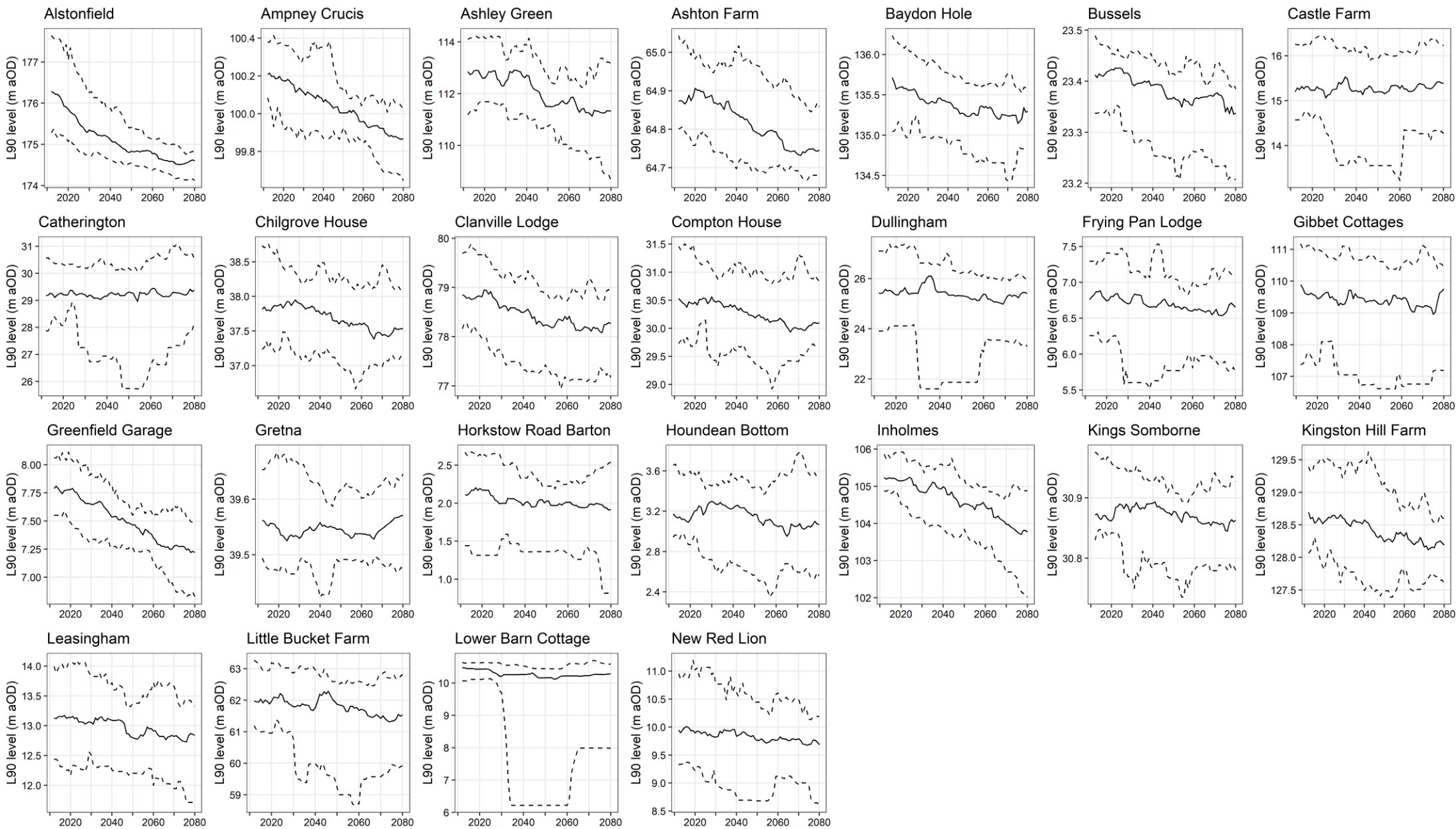


Figure S11a -- The 90% exceedance level (L90; m aOD) modelled by Aquimod over transient 30-year time slices in simrcm data, 1983-2080, for 25 boreholes. L90 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. The simrcm median and the simrcm maximum and minimum are indicated by solid and dashed lines, respectively.

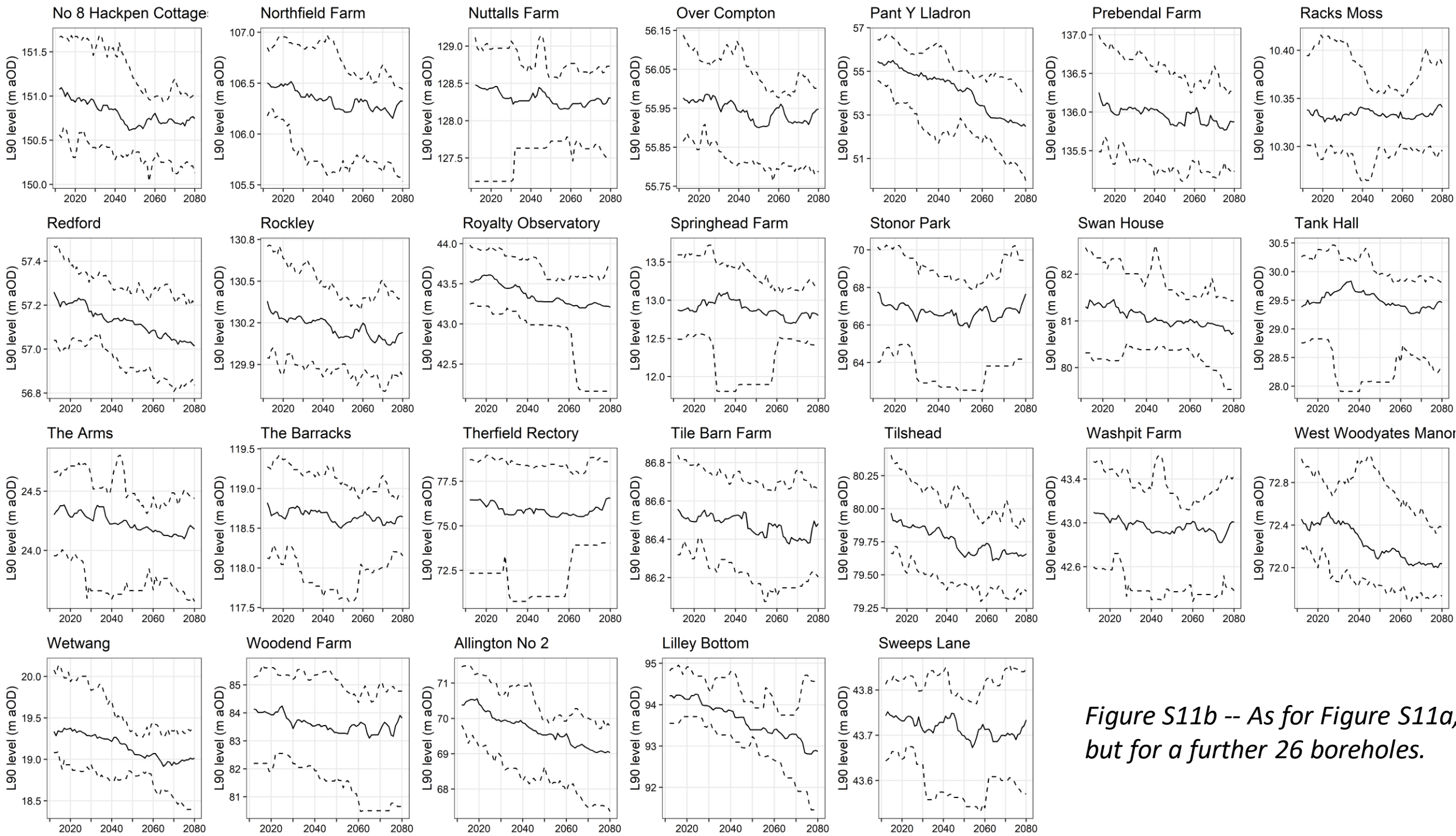


Figure S11b -- As for Figure S11a, but for a further 26 boreholes.

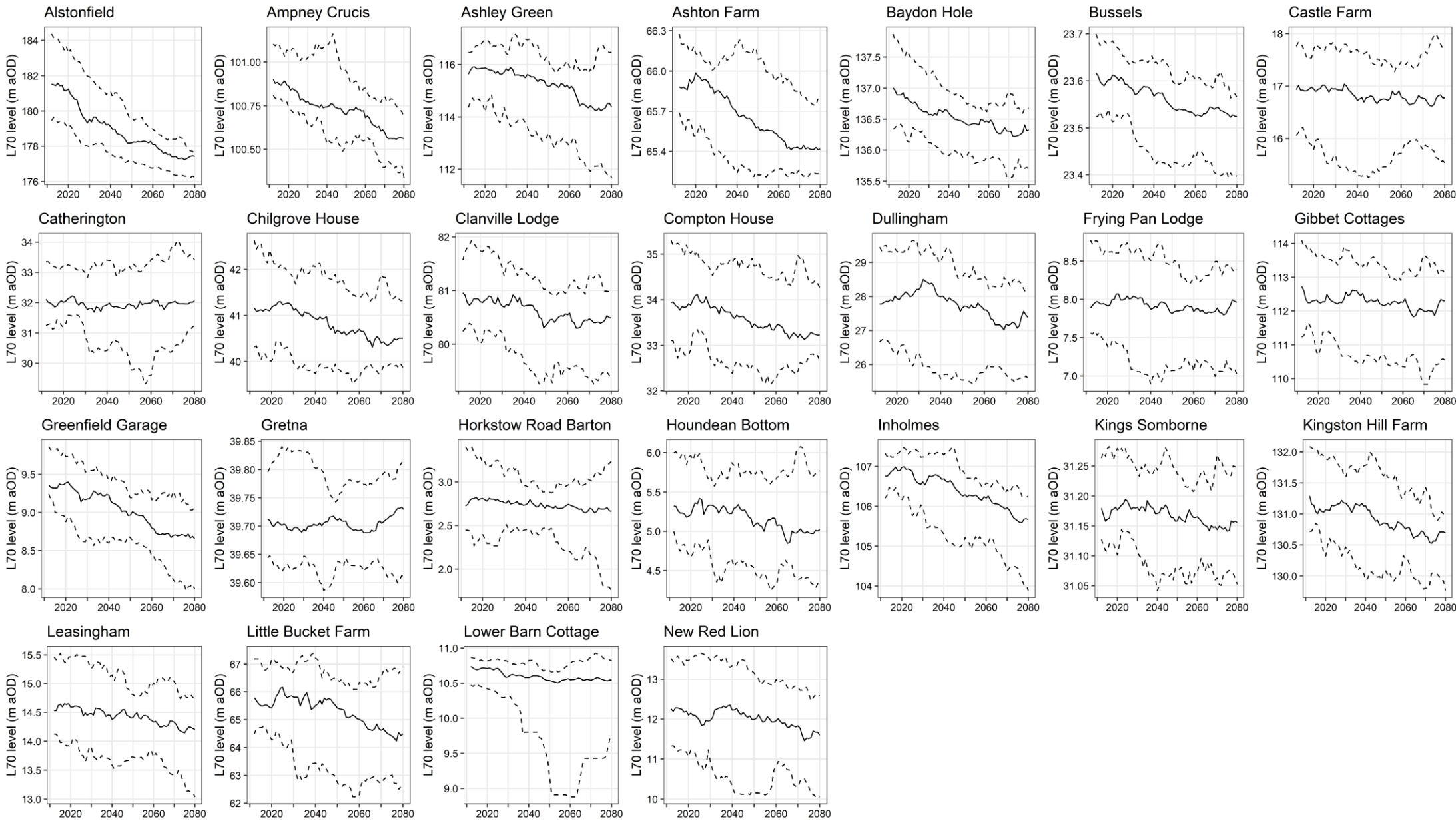


Figure S12a -- The 70% exceedance level (L70; m aOD) modelled by AquMod over transient 30-year time slices in simrcm data, 1983-2080, for 25 boreholes. L70 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. The simrcm median and the simrcm maximum and minimum are indicated by solid and dashed lines, respectively.

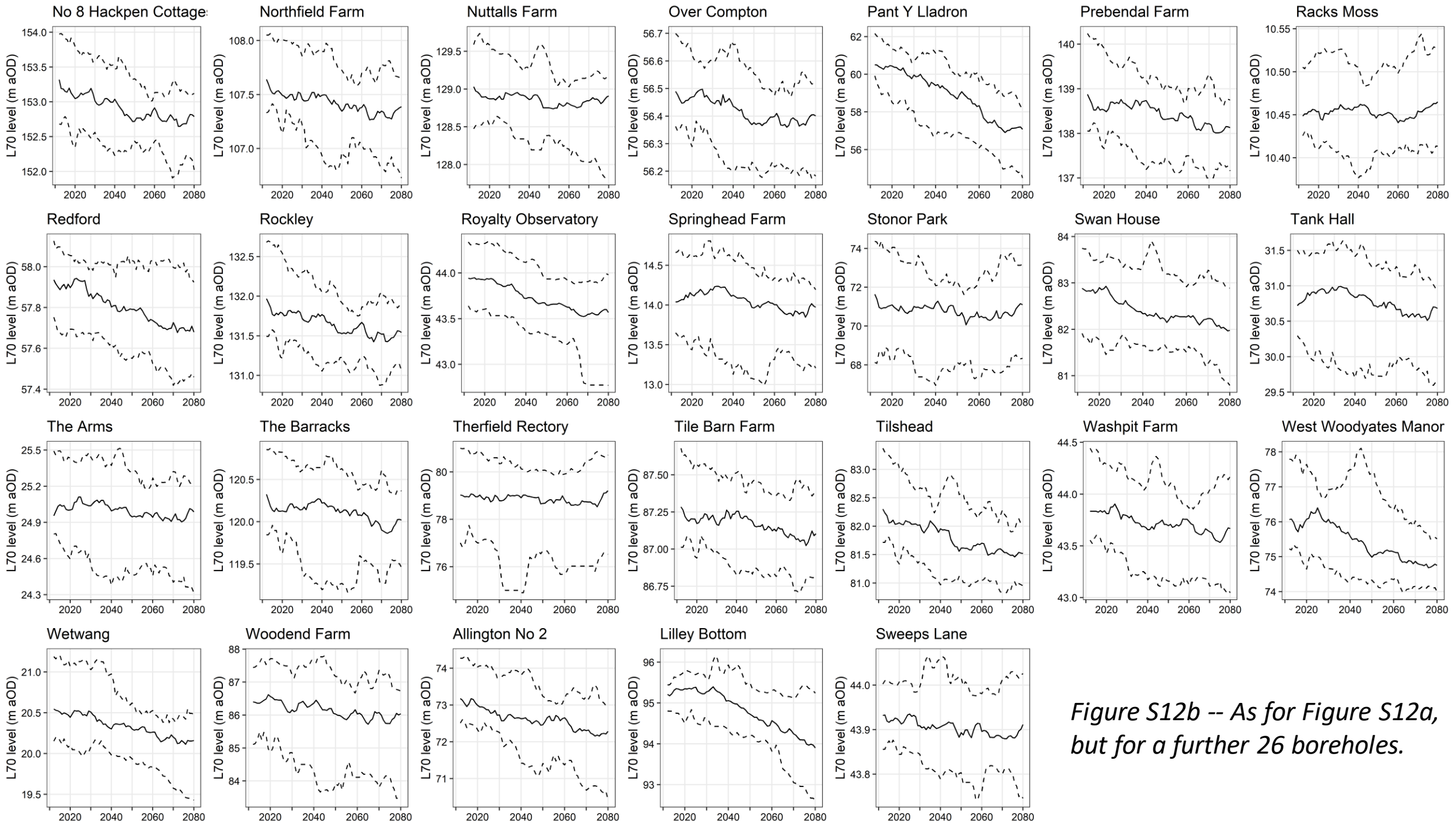


Figure S12b -- As for Figure S12a, but for a further 26 boreholes.

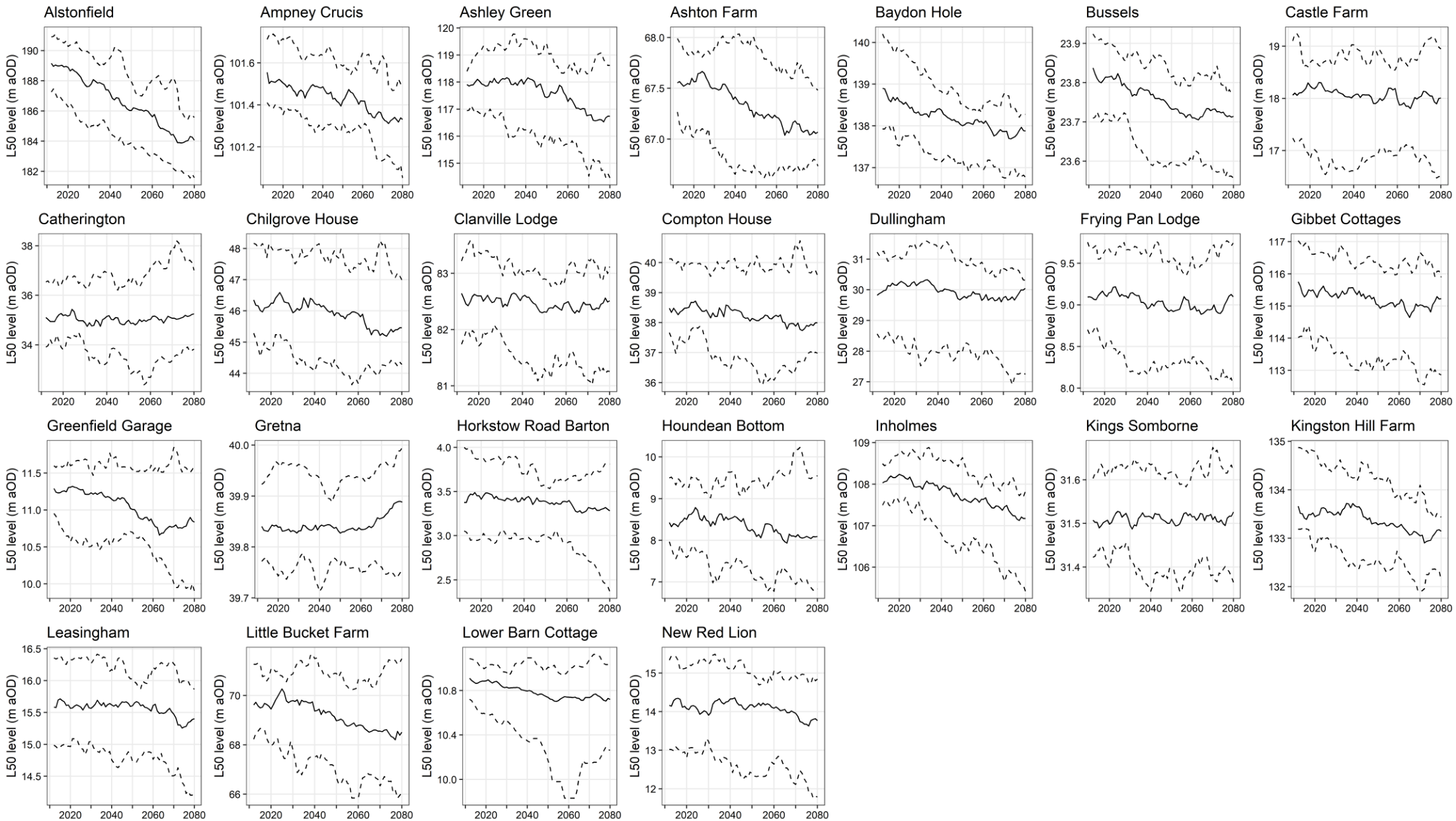


Figure S13a -- The 50% exceedance level (L50; m aOD) modelled by Aquimod over transient 30-year time slices in simrcm data, 1983-2080, for 25 boreholes. L50 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. The simrcm median and the simrcm maximum and minimum are indicated by solid and dashed lines, respectively.

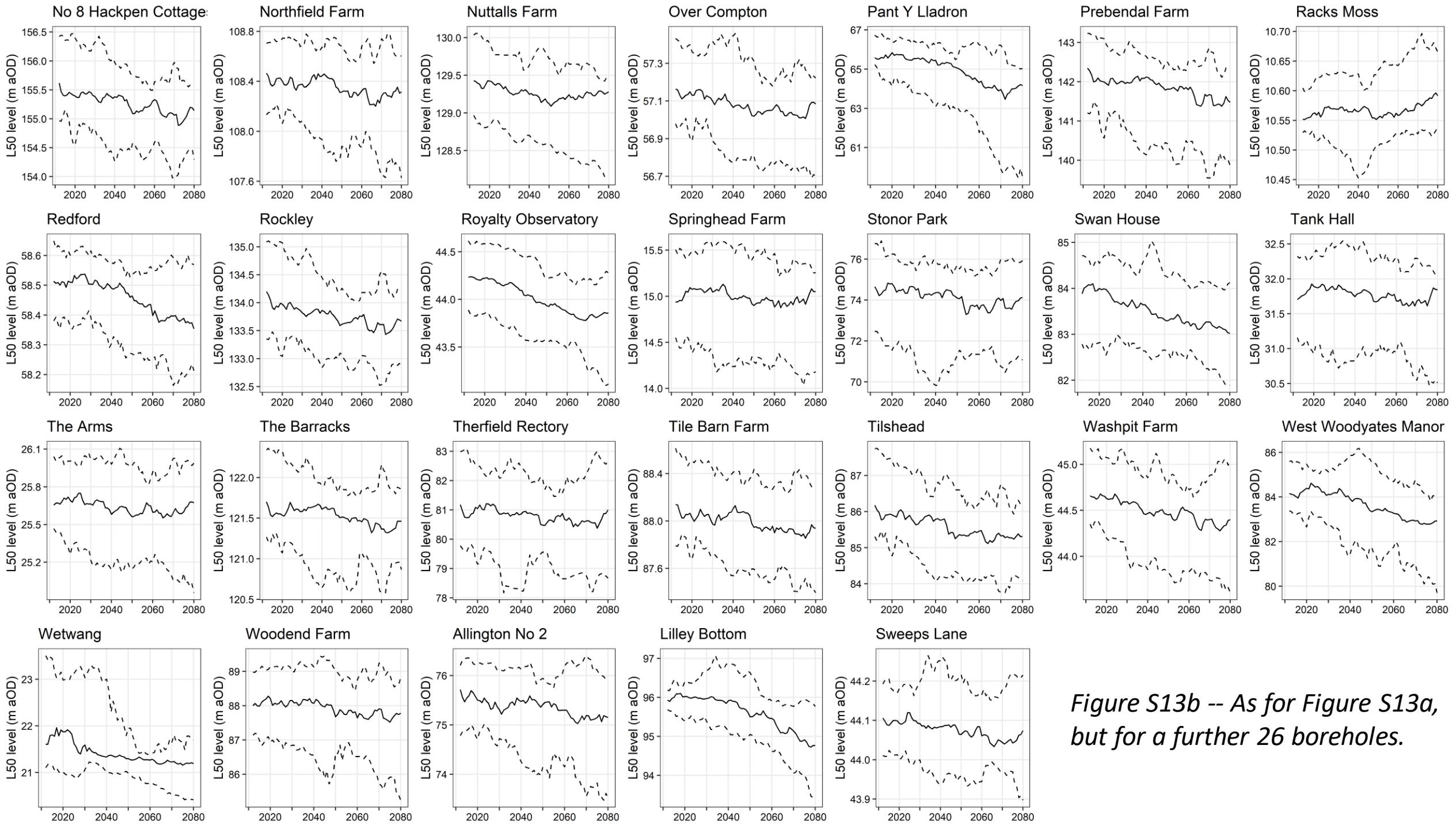


Figure S13b -- As for Figure S13a, but for a further 26 boreholes.

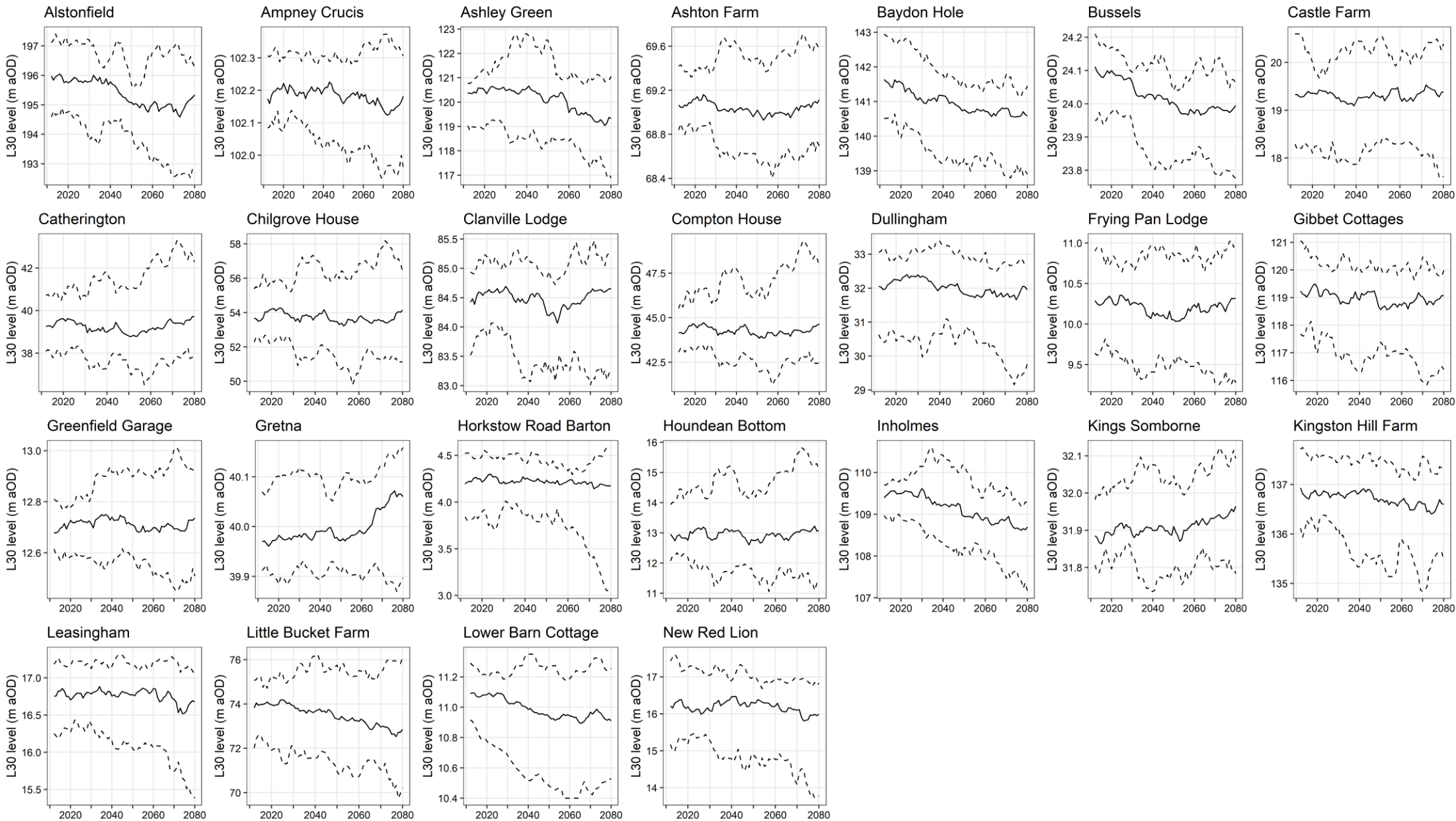


Figure S14a -- The 30% exceedance level (L30; m aOD) modelled by Aquimod over transient 30-year time slices in simrcm data, 1983-2080, for 25 boreholes. L30 calculated over 1983-2012 is plotted in 2012, over 1984-2013 in 2013, and so on. The simrcm median and the simrcm maximum and minimum are indicated by solid and dashed lines, respectively.

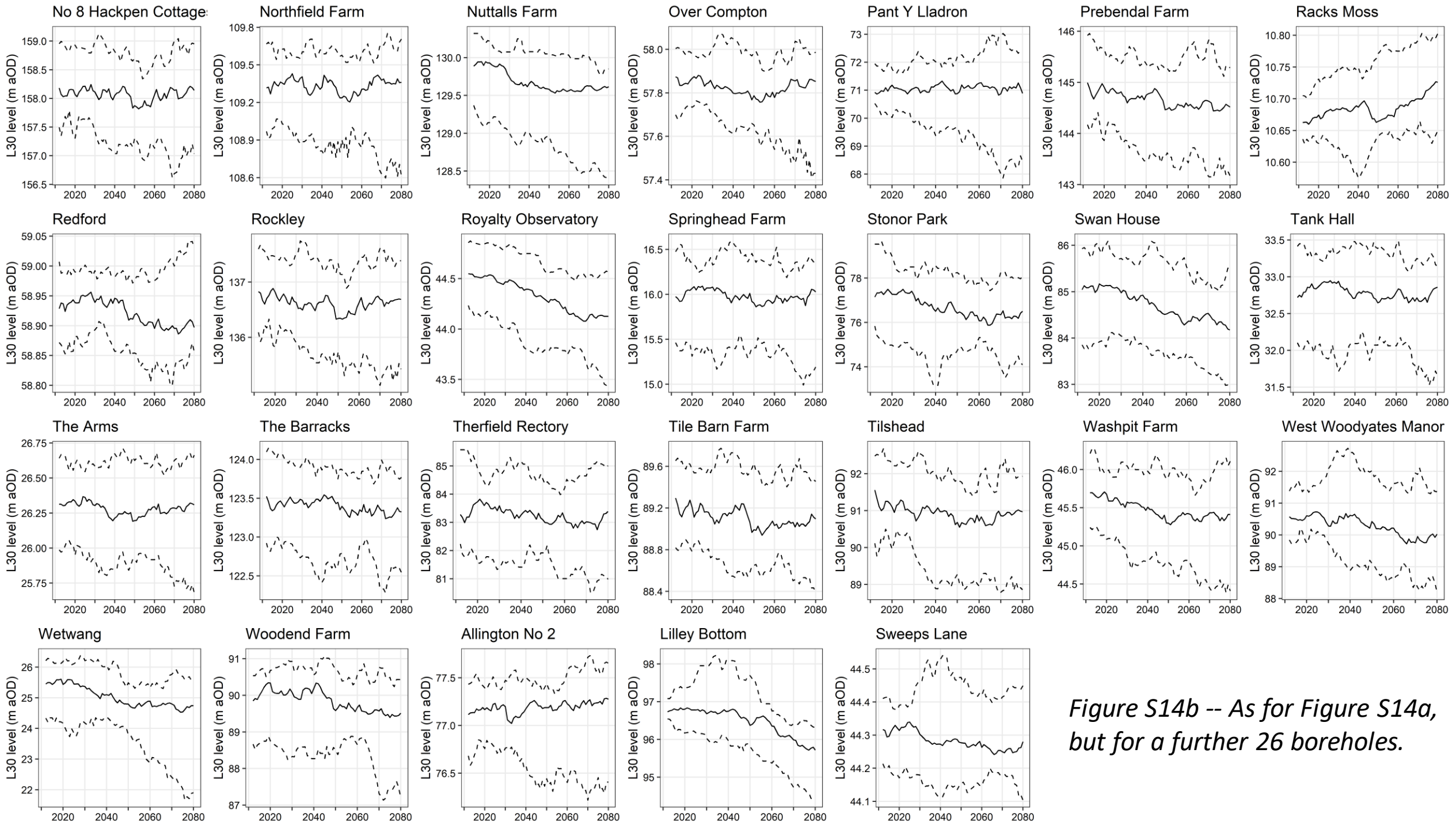


Figure S14b -- As for Figure S14a, but for a further 26 boreholes.