Table S1. (excel spreadsheet) Summary statistics (r^2 of linear regressions of observed vs. predicted temperature, as well as root mean square deviation (RMSD, ºC) and proportional root mean square deviation (RMSDp, decimal %)) for tests of the microclimate predictions (splined to 365 days) against 3-hourly observations of soil temperature from the Soil Climate Analysis Network37 (SCAN, http://www.wcc.nrcs.usda.gov/scan/).

Script S1. (R script) An R script showing how to interact with the microclim data files.

Figure S1. Three years (2007-2009) of hourly observations (red) of surface and soil temperatures for Peth Airport, Western Australia (a cool temperate coastal location) compared against predictions (black) from Kearney *et al.*[1] using interpolated historical daily data (left column) and from daily interpolations of the monthly predictions from the microclim dataset (right column). The top panels show the simulated air temperature 0.5 cm above the ground (black lines), the observed air temperature 0.5 cm above the ground (red circles – 'terrestrial minimum' observations) and the soil surface temperature (grey lines). In all other panels the black lines are predictions and the red lines are observations.

Figure S2. Three years (2007-2009) of hourly observations (red) of surface and soil temperatures for Darwin Airport, Northern Territory Australia (a tropical coastal location), compared against predictions (black) from Kearney *et al.*[1] using interpolated historical daily data (left column) and from daily interpolations of the monthly predictions from the microclim dataset (right column). The top panels show the simulated air temperature 0.5 cm above the ground (black lines), the observed air temperature 0.5 cm above the ground (red circles – 'terrestrial minimum' observations) and the soil surface temperature (grey lines). In all other panels the black lines are predictions and the red lines are observations.

Figure S3. Three years (2007-2009) of hourly observations (red) of surface and soil temperatures for Bushy Parks near Hobart, Tasmania Australia (a cool temperate coastal location) compared against predictions (black) from Kearney *et al.*[1] using interpolated historical daily data (left column) and from daily interpolations of the monthly predictions from the microclim dataset (right column). The top panels show the simulated air temperature 0.5 cm above the ground (black lines), the observed air temperature 0.5 cm above the ground (red circles – 'terrestrial minimum' observations) and the soil surface temperature (grey lines). In all other panels the black lines are predictions and the red lines are observations.

Figure S4. Three years (2007-2009) of hourly observations (red) of surface and soil temperatures for Wagga Wagga, New South Wales Australia (an inland warm-temperate location) compared against predictions (black) from Kearney *et al.*[1] using interpolated historical daily data (left column) and from daily interpolations of the monthly predictions from the microclim dataset (right column). The top panels show the simulated air temperature 0.5 cm above the ground (black lines), the observed air temperature 0.5 cm above the ground (red circles – 'terrestrial minimum' observations) and the soil surface temperature (grey lines). In all other panels the black lines are predictions and the red lines are observations.

Figures S1-S177 (data repository). Three-hourly observations of soil temperature form the Soil Climate Analysis Network (SCAN) for 177 sites across the USA (including Alaska and Puerto Rico) for all available times between 2011 and 2013 (black lines) plotted against 365-day interpolations of the 'microclim' simulations (red). The image of the SCAN site, from http://www.wcc.nrcs.usda.gov/scan/, is also shown for comparison.

Figure S1.

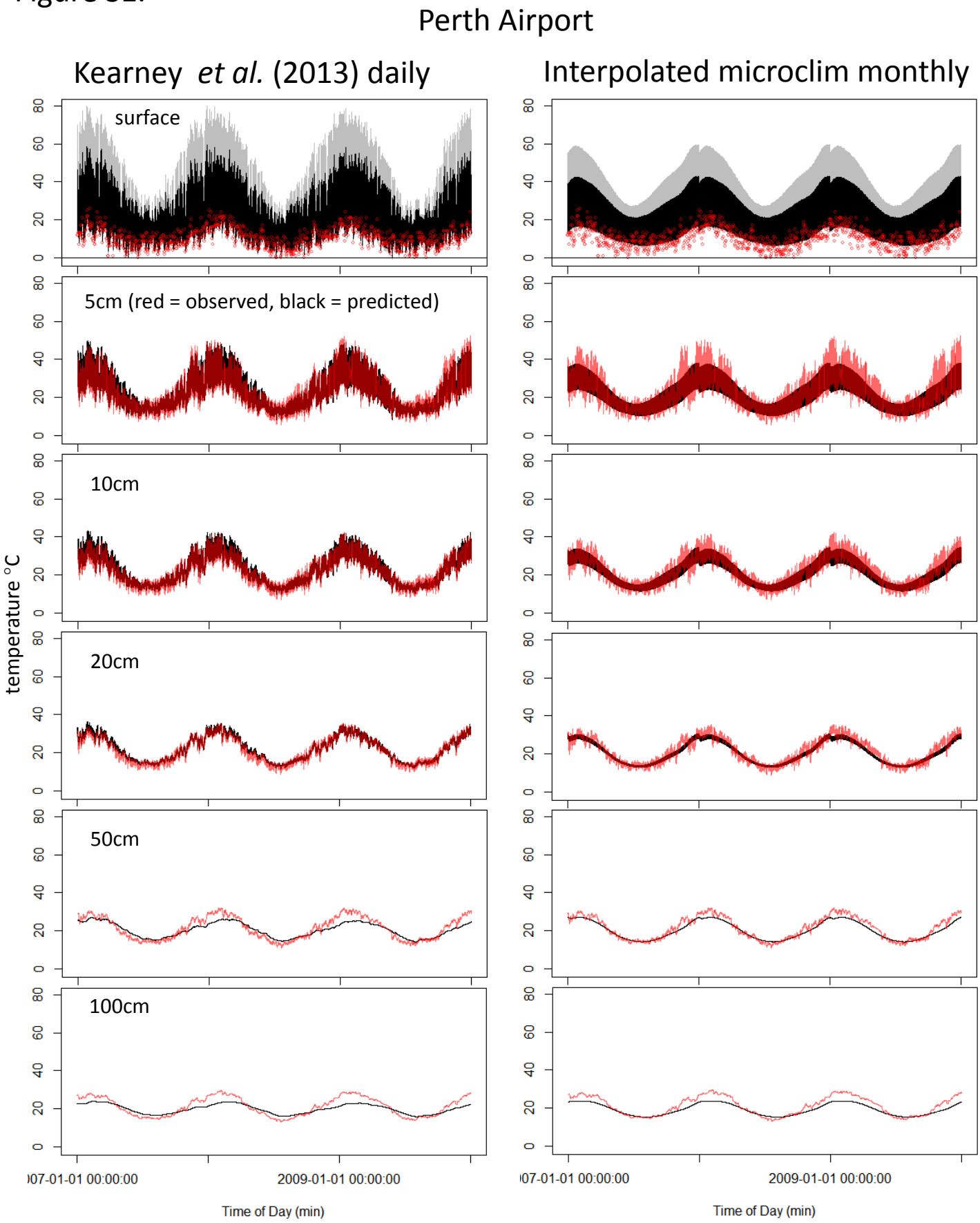

Perth Airport
Kearney *et al.* (2013) daily
Interpolated microclim monthly
surface
5cm (red = observed, black = predicted)
10cm
20cm
50cm
100cm
temperature °C
0
20
40
60
80
2007-01-01 00:00:00
2009-01-01 00:00:00
Time of Day (min)

Figure S2.

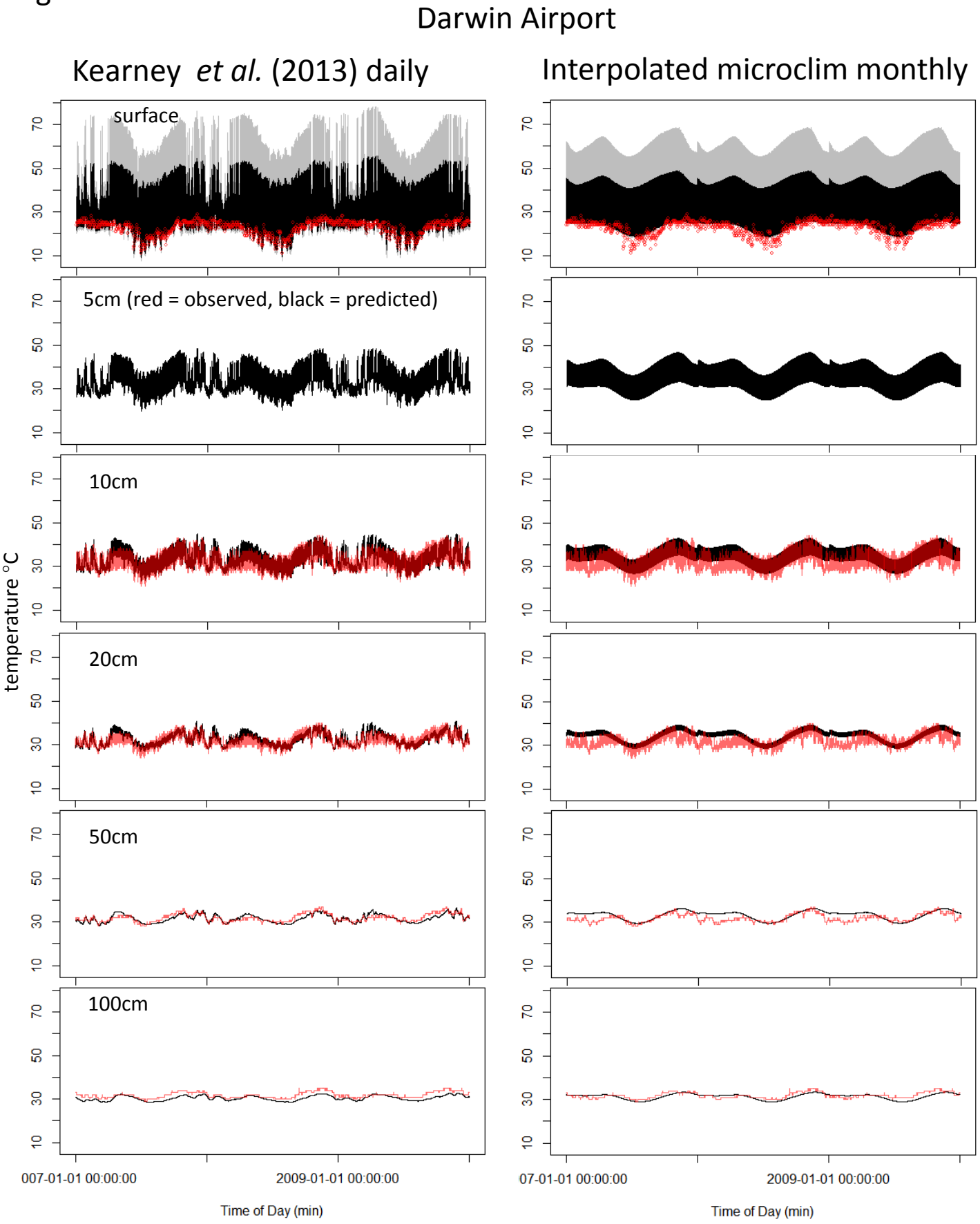

Darwin Airport
Kearney et al. (2013) daily
Interpolated microclim monthly
surface
5cm (red = observed, black = predicted)
10cm
20cm
50cm
100cm
temperature °C
10
30
50
70
007-01-01 00:00:00
2009-01-01 00:00:00
07-01-01 00:00:00
2009-01-01 00:00:00
Time of Day (min)
Time of Day (min)

Figure S3.

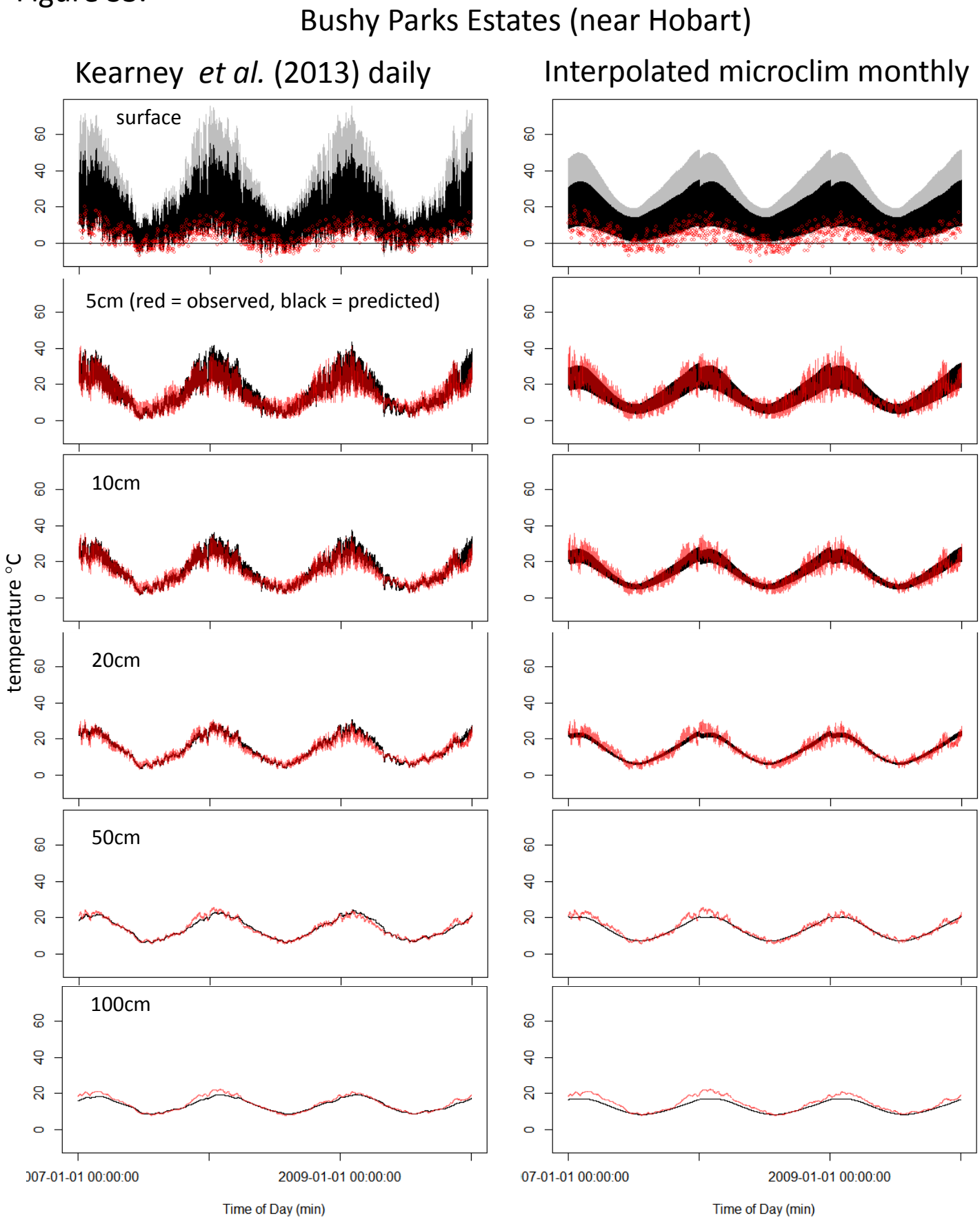
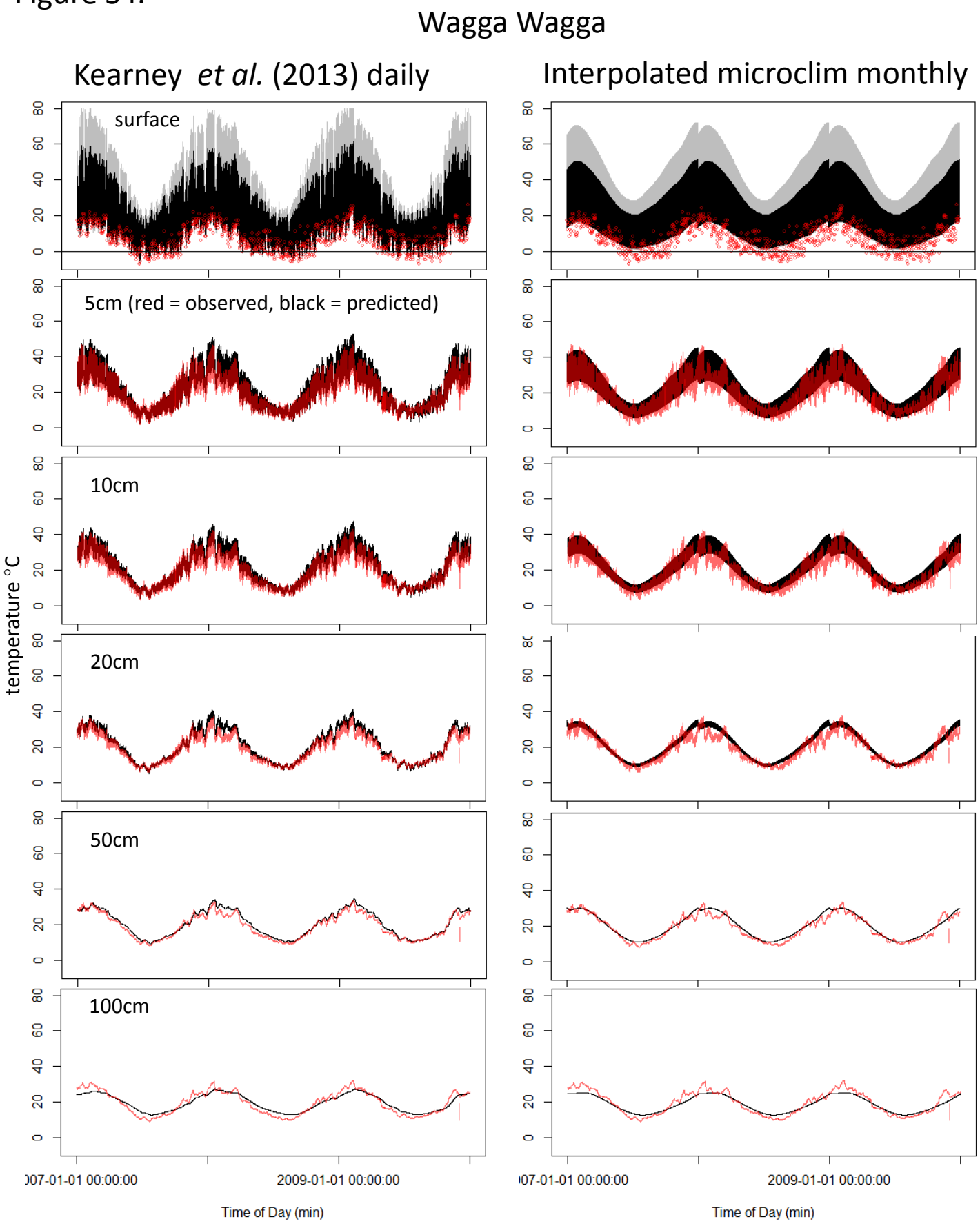

Bushy Parks Estates (near Hobart)
Kearney et al. (2013) daily
Interpolated microclim monthly
surface
5cm (red = observed, black = predicted)
10cm
20cm
50cm
100cm
temperature °C
0
20
40
60
007-01-01 00:00:00
2009-01-01 00:00:00
07-01-01 00:00:00
2009-01-01 00:00:00
Time of Day (min)
Time of Day (min)

Figure S4.


Wagga Wagga
Kearney *et al.* (2013) daily
Interpolated microclim monthly
surface
5cm (red = observed, black = predicted)
10cm
20cm
50cm
100cm
temperature °C
0
20
40
60
80
2009-01-01 00:00:00
Time of Day (min)