SUPPLEMENTARY ONLINE MATERIALS

**Comparison between heat waves in ERA Interim and station data for 1989-2011**

Both minimum and maximum daily temperatures are required to identify heat waves in Bangladesh (Nissan et al., 2017). Unfortunately, lack of direct observations for minimum and maximum temperatures within datasets available for the full study period (1979-2005) necessitated the use of reanalysis data to evaluate the simulation of heat waves by climate models.

Here we briefly evaluate whether ERA Interim adequately captures observed minimum/maximum temperatures and heat wave indicators based on station data from the Bangladesh Meteorological Department (BMD) for the period 1989-2011 for which station data were available. Details about the treatment of these data, including quality control, as well as the spatial distribution of the 35 stations across the country can be found in Nissan et al. (2017).

SOM Figure 1 shows the annual cycle of observed and reanalysis minimum and maximum temperatures averaged across Bangladesh. Minimum daily temperatures in ERA Interim are warmer than observed, while maximum temperatures are cooler, resulting in a dampening of the diurnal cycle in the reanalysis. Absolute temperatures between the two datasets are not expected to correspond because BMD data report the observed minimum and maximum temperatures, while ERA-Interim data are only available at six-hourly intervals, which would not coincide with the timing of the true minimum/maximum values.

The observed average annual heat wave frequency was well-captured by ERA Interim within the margin of error, with 1.7 ± 0.4 heat waves days observed per year, and 1.9 ± -0.6 captured by the reanalysis. Interannual variability in heat wave frequency, measured as the standard deviation, was 2.2 ± 0.2 heat waves according to observations and 2.7 ± 0.2 heat waves in the reanalysis. The annual heat wave cycle was also well represented, as shown in SOM Figure 2.



SOM Figure 1 Annual cycle of minimum and maximum temperatures averaged over Bangladesh in ERA Interim and BMD station data, for the period 1989-2011.



SOM Figure 2 Average monthly frequency (black dots) and interannual range (red crosses) of heat-wave days in BMD observations and in ERA Interim reanalysis over the period 1989-2011.