

## Supplementary material:

**Figure S1: PBL air temperature sensitivity to urban fraction parameter.**

The (a,c) WINTER and (b,d) SUMMER air temperature differences between the def and real simulations for the SLUCM\_MYJ (first row) and BEP\_MYJ (second row) configurations. Positive values indicate an increase in that particular field after the application of the urban fraction algorithm. The solid black line represents the elevation of Indianapolis above mean sea level (MSL). The comparisons were done for model grid points that were designated as an NLCD 2006 urban cover land cover type.

