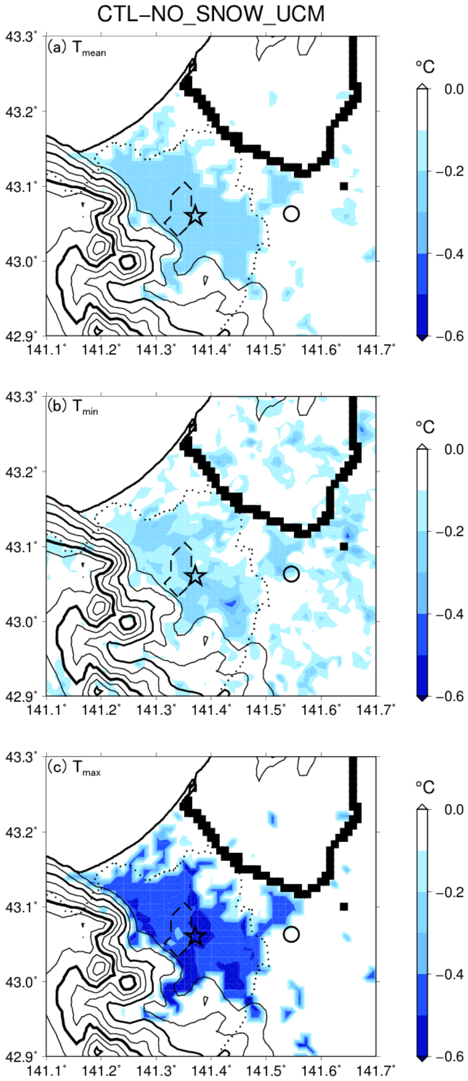
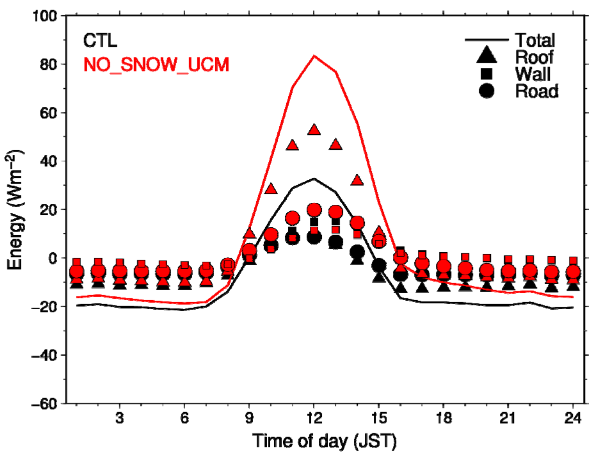
Mori, K., and T. Sato, 2015: Evaluating the role of snow cover in urban canopy layer on the urban heat island in Sapporo, Japan with a regional climate model. *J. Meteor. Soc. Japan*, **93**, 581-592. https://doi.org/10.2151/jmsj.2015-039



←Figure 1. Monthly mean (a) daily mean, (b) daily minimum, and (c) daily maximum temperature differences between the CTL and NO_SNOW_UCM runs in January 2009.

↓ Figure 2. Diurnal variations of monthly mean sensible heat flux derived from the UCM averaged across all urban grid points in the CTL (black) and NO_SNOW_UCM (red) runs. The line represents total sensible heat flux from the urban canopy (excluding anthropogenic heat). Symbols indicate roofs (triangles), walls (squares), and roads (circles).



- This study assesses the effect of snow cover in urban canopy on winter heat islands using the Weather Research and Forecasting Model coupled with an urban canopy model.
- A sensitivity test with realistic snow cover run (CTL) and snow-free urban run (NO_SNOW_UCM) reveals that snow cover in urban areas acts to decrease surface air temperature (Fig. 1), with a stronger decrease in daily maximum temperatures (0.4−0.6 °C) than daily minimum temperatures (0.1−0.3 °C).
- The increase in surface albedo due to snow cover is primarily responsible for the decrease in net shortwave radiation and the sensible heat flux. In addition, increased evaporation causes a weakened sensible heat flux. The decrease in sensible heat flux at 1200 JST (50.6 W m^{-2}) is comparable magnitude to the anthropogenic heat release.
- Snow cover on the building roofs reduces surface air temperature because of sensible heat flux decrease (43.1 W m^{-2}), corresponding to 85% of the total sensible heat flux decrease at 1200 JST in the UCM (Fig. 2).