The presence of a heat low is a key feature of the Australian climate in the warmer months. The onset of the North-Australian summer monsoon may be partly tied to the heat low as the latter strengthens in the southern-hemisphere spring. Trough lines associated with heat lows in connection with synoptic cold fronts bring significant cool-changes to south-eastern Australia. An important feature of heat lows, at least in a quiescent environment, is the formation of an upper-level anticyclone, the formation of which has a close analogy with the upper anticyclone over tropical cyclones.

I will show results of some numerical simulations to examine the structure and dynamics of the Australian heat low and the associated upper-level anticyclone. The numerical experiments are carried out with the Pennsylvania State University / UCAR mesoscale model MM5. One simulation is performed in an idealized setting; the other is a case study of a well-formed heat low that occurred over Australia in February 2010.