= Wake low =

A wake low , or wake depression , is a mesoscale low @-@ pressure area which trails the mesoscale high following a squall line . Due to the subsiding warm air associated with the systems formation , clearing skies are associated with the wake low . Once difficult to detect in surface weather observations due to their broad spacing , the formation of mesoscale weather station networks , or mesonets , has increased their detection . Severe weather , in the form of high winds , can be generated by the wake low when the pressure difference between the mesohigh preceding it and the wake low is intense enough . When the squall line is in the process of decay , heat bursts can be generated near the wake low . Once new thunderstorm activity along the squall line ends , the wake low associated with it weakens in tandem .

= = Formation = =

Wake lows form due to adiabatic warming in the wake of mature squall lines at the back edge of their rain shields , where evaporative cooling is unable to offset warming due to atmospheric subsidence , or downward motion . They can be caused by gravity waves which duct through boundary layers which are deep and cold to the north of a weather front . As with mesoscale high @-@ pressure areas behind a squall line , when new thunderstorm development stops along the squall line , the wake low will weaken as well . Clearing conditions will accompany the wake low , due to the descending warm air mass associated with the feature . Within the United States , these systems have been observed to form in the Mississippi river valley , Southeast , Florida , and Great Plains .

= = Detection = =

Both direct and indirect ways have been found to indicate the presence of a wake depression . The most direct is through the use of surface observations . Prior to the development of mesoscale weather station networks , or mesonets , it was difficult to find wake lows . With the advent of mesoscale networks , wake lows have become easier to find . On weather satellite and weather radar imagery , wake lows and heat bursts normally occur on the back side of a precipitation area . However , within larger precipitation areas , they can be located within the area showing a minimum of returns . When using velocity data from a WSR @-@ 88D doppler radar , high winds on the back edge of reflectivity data can give away the location of a wake low .

= = Association with heat bursts = =

Heat bursts are rare atmospheric phenomenon characterized by gusty winds and a rapid increase in temperature and decrease in dew point (moisture) . Heat bursts typically occur during night @-@ time and are associated with decaying thunderstorms . In association with wake lows , heat bursts are caused when rain evaporates (virga) into a parcel of cold dry air high in the atmosphere making the air denser than its surroundings . The parcel descends rapidly , warming due to compression , overshoots its equilibrium level and reaches the surface , similar to a downburst .

Recorded temperatures during heat bursts have reached well above 90 ° F (32 ° C) , sometimes rising by 20 ° F (11 ° C) or more within only a few minutes . More extreme events have also been documented , where temperatures have been reported to exceed 130 ° F (54 ° C) , although such extreme events have never been officially verified . Heat bursts are also characterised by extremely dry air and are sometimes associated with very strong , even damaging , winds .