AWOC Winter Weather Track FY10, IC4.3: Microclimates

Fog and Temperature considerations at Hutchinson, Kansas ASOS

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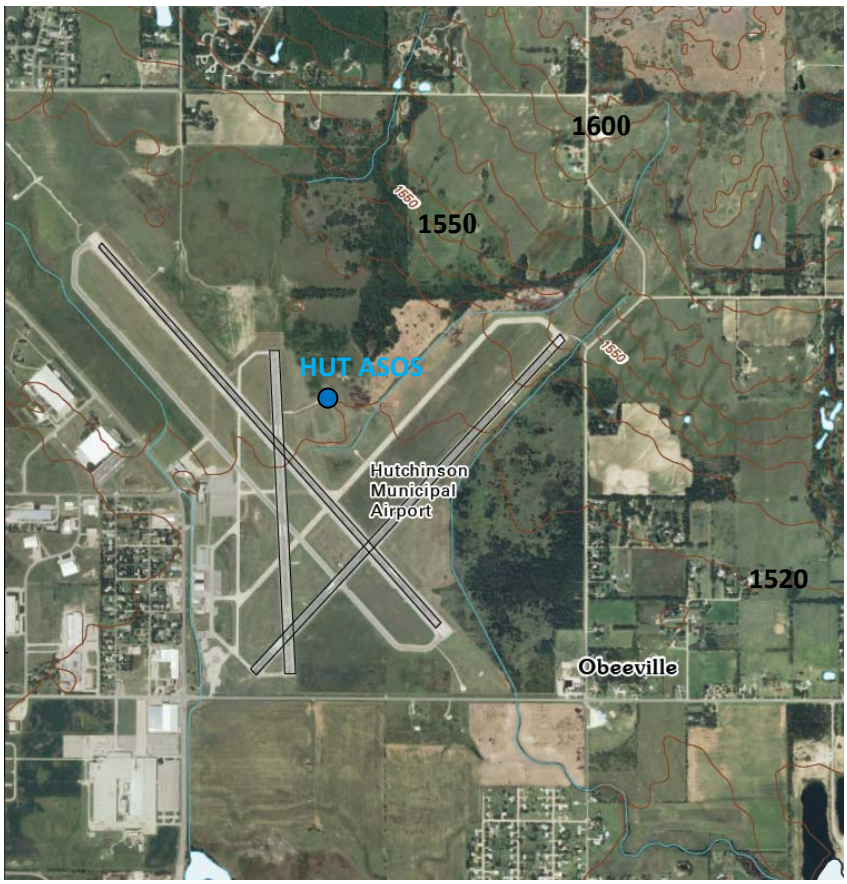
At WFO Wichita, KS, when working the short term forecast desk and issuing Aviation forecasts (TAF) new forecasters to the office, quickly learn about the microclimate at the Hutchinson, Kansas Airport. The Hutchinson, Kansas Automated Surface Observing Station (ASOS) is located at the Hutchinson Municipal Airport. The airport itself is located in a local minimum in elevation and the ASOS instruments are located on the airport grounds in yet another small valley. The QUAD MAP for the Hutchinson area shows that the center of the airport is located at 1515 ft ASL and the ASOS site is located about 1520 ft ASL. The elevation increases quickly to the northeast and northwest of the ASOS location. Immediately south of the ASOS the elevation stays around 1515 ft. ASL and drops even lower. Regardless, the airport sits in a surface depression, which will wreak havoc on observations at the ASOS site compared to observations at nearby COOP sites. Because of the local minimum in elevation, after the nighttime inversion sets up, surface winds often decouple allowing temperatures to plummet even further. As a result, the Hutchinson ASOS site tends to see fog sooner than most other sites in the Wichita, KS CWA, however, the majority of the time the fog is localized.



When TAF forecasts are issued for KHUT, for example, if decoupling is expected under a surface high pressure flow regime, then it is usually wise for forecasters to drop visibilities and introduce BR into the TAF. This may not occur at any other TAF sites in the CWA, but reduced visibilities will likely be seen at KHUT under these conditions. Scenarios to consider:

1. If there is a reasonable amount of boundary layer moisture in place over the area, or it rained the night before, and a surface high is moving across Central/South Central Kansas with light winds/clear skies, at least patchy radiation fog will tend to occur at HUT whereas it may or may not occur at some of our other sites.

    a. Solution: May want to introduce lower visibilities and/or BR into the TAF forecast for KHUT, when you would not forecast them for surrounding TAF sites.

2. Because the HUT ASOS sits in a small depression, it radiates out much faster than other sites. Because of this, it's very easy for KHUT to drop to Instrument Flight Rules (IFR) visibilities (<3 SM) even in the more marginal patchy/ground fog setups.

    a. Solution: Watch hourly temperatures for a significant drop, and update the forecast. Another thing to watch is if you haven't placed lower visibilities in your TAF and you see the drop in temperatures to go ahead and be proactive in amending the TAF for expected lower flight restrictions.

3. During radiational fog setups, HUT will often see reduced visibilities before surrounding observations sites. So I may tend to bring down their visibilities a little faster than say ICT or RSL or SLN.

    a. Solution: When expecting radiational fog at numerous locations go ahead and drop visibilities and ceilings at KHUT an hour or two faster than at other TAF sites.

Whether it's fog, temperatures or even wind speeds or direction, the depression that the Hutchinson, KS ASOS sits in requires that the forecaster consider an adjustment to the forecast if specific conditions are expected. The question can often be asked, "Are we forecasting for the ASOS site, or for the town of Hutchinson?" While there isn't necessarily a right or wrong answer to this question, it is an interesting one to bring up when deciding upon how to forecast for the area, when verification is attained by the ASOS. The microclimate at the Hutchinson airport is something to be aware of for all persons working at the Wichita forecast office.