

AWOC Winter Weather Track FY06
IC 4.3 Microclimate Exercise:
The Nishnabotna and other Central Iowa River Valleys

Overview: Given favorable radiational cooling conditions while under the influence of surface high pressure, several low lying and river valley locations across central Iowa will routinely experience colder nighttime (minimum) temperatures compared to other surrounding sites. The most notable area affected is the Nishnabotna River Valley (Nish Valley) located in southwest Iowa. Other areas of interest include the upper reaches of the Des Moines, Skunk, Iowa and Cedar River Valleys.

Particular sites that are affected within the DMX CWA include Audubon (ADU) and Atlantic (AIO) in the Nish Valley, Ames (AMW) in the Skunk River Valley, Marshalltown (MIW) in the Iowa River Valley and Waterloo (ALO) in the Cedar River Valley. These sites will typically be the coldest during times of ideal radiational cooling conditions (clear skies, light winds).

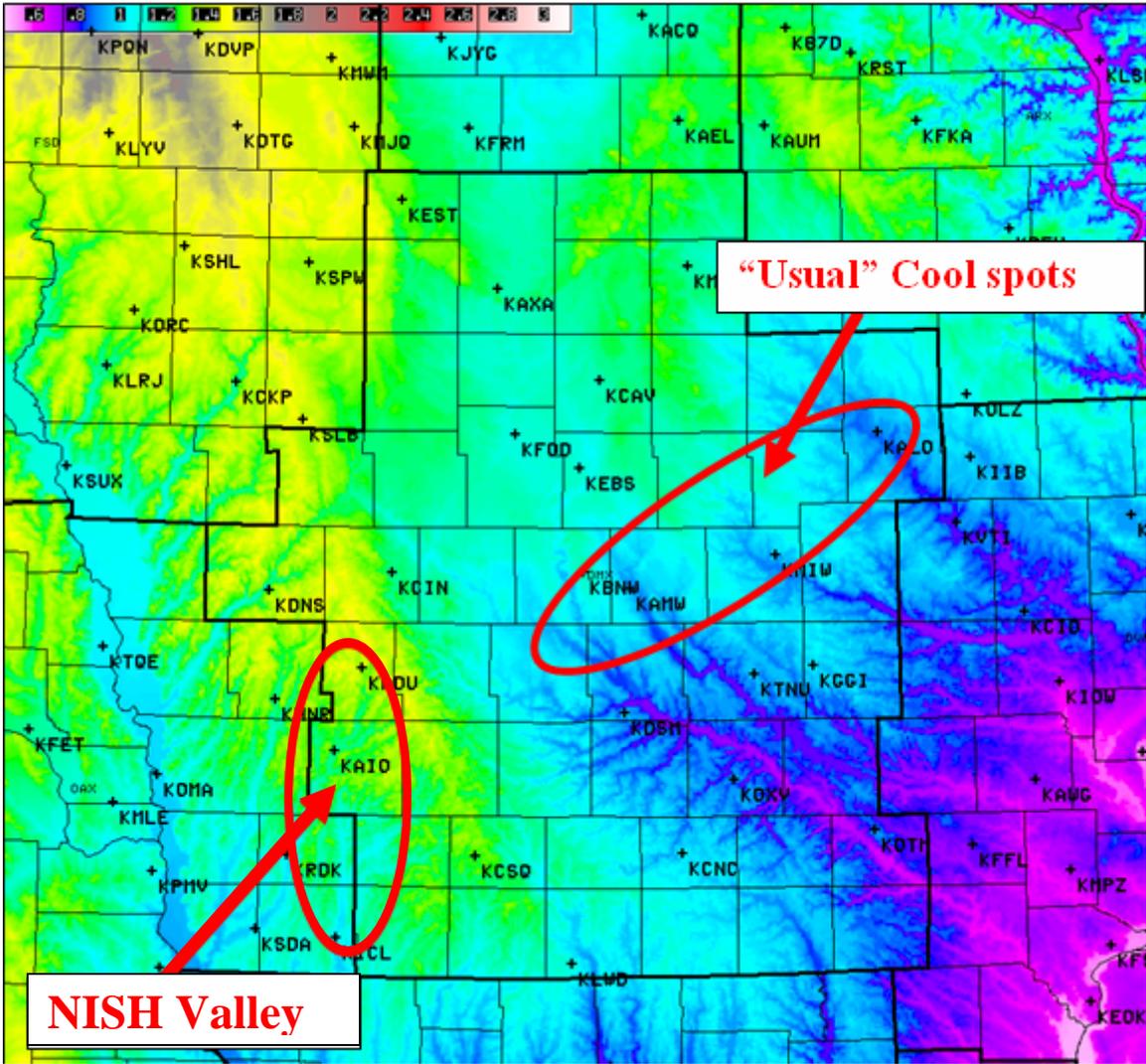
Climatology: In terms of climatology, local studies have shown that when compared to Des Moines (DSM) - which usually verifies as the warmest site in regards to minimum temperature year round – the aforementioned sites can range anywhere from 3 to 7 degrees cooler on average with the largest spread occurring in the fall.

Operational Impacts: When forecasting low temperatures on nights when ideal radiational cooling is present, be cognizant of potential large temperature variations that will likely occur in the river valley locations. MOS guidance usually does a fairly good job in depicting the usual colder locations; however don't be afraid to undercut the output by a few degrees – especially in cases where you have an anomalous high pressure system and below normal precipitable water values.

GFE Tools: Edit areas are available to capture the Nish Valley as well as other low lying sites.

Future Considerations: The extent of horizontal temperature variations, especially in the deeper, narrower Nish Valley region would need to further investigated on a smaller scale (approx. LTE 5km). Overall, the MOS guidance as well as our local GFE edit area tools are generally too broad and do not totally capture the fine detail of the terrain. The new Gridded MOS data should alleviate some of the issues with the implied finer resolution detail and the horizontal temperature variations.

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"Usual" Cool spots

NISH Valley