

Urban effects on ice fog at temperatures 40 below or lower.

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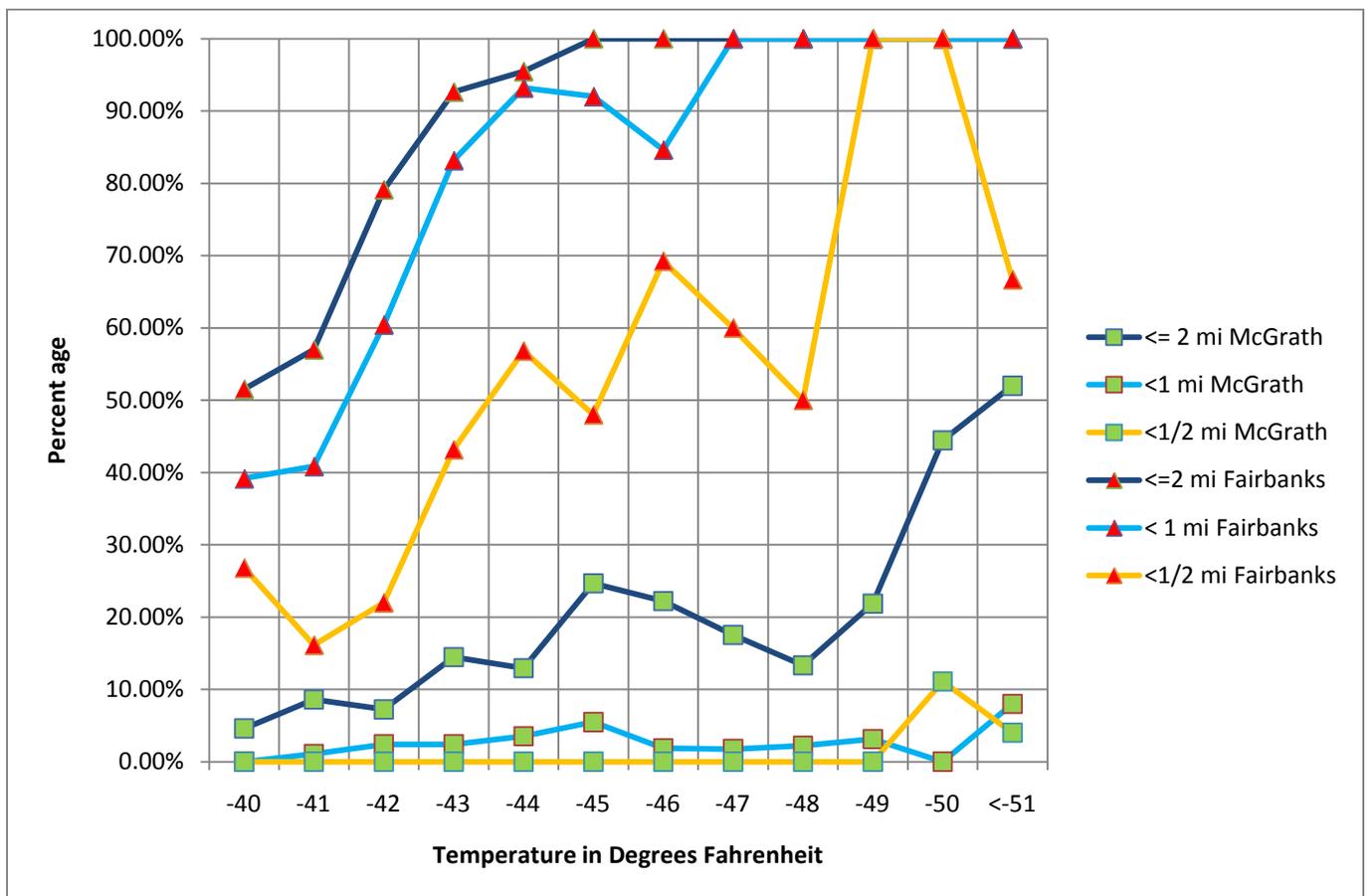
26 Jan 2010

When temperatures fall to 40 below zero in Fairbanks, ice fog forms due to the urban output of moisture. Frequently visibilities fall to less than mile in Fairbanks significantly impacting commerce. In more rural areas this happens much less frequently.

Looking at ASOS data since January of 2005, we can see there is a significant difference between the relative urban area of Fairbanks and the comparatively rural area of McGrath.

In Fairbanks when temperatures fall below 42 below, more than 80% of the time you will have visibilities less than a mile. For McGrath when the temperatures fall below 42 below, significant fog forms less than 25% of the time. Both of these locations are valley locations with no significant differences in wind.

This graphs shows the percentage of times, at a given temperature, when the visibility it reduced to less than 2 miles, 1 mile, and a half mile.



This graph can be very useful when writing Terminal Aerodrome Forecasts (TAFS). If you are familiar with the ice fog forming in Fairbanks around 42 below you might expect something similar in McGrath when temperatures fall below 42 below.

This shows that when forecasting for different areas you need to be aware of the effect of urbanization on climate. With all other factors similar, there can be significant differences in the conditions that occur due just to the number of people living in the area.