Frequency and Distribution of Alaska Region AIRMETs in 2009

Alaska Aviation Weather Unit

Written by

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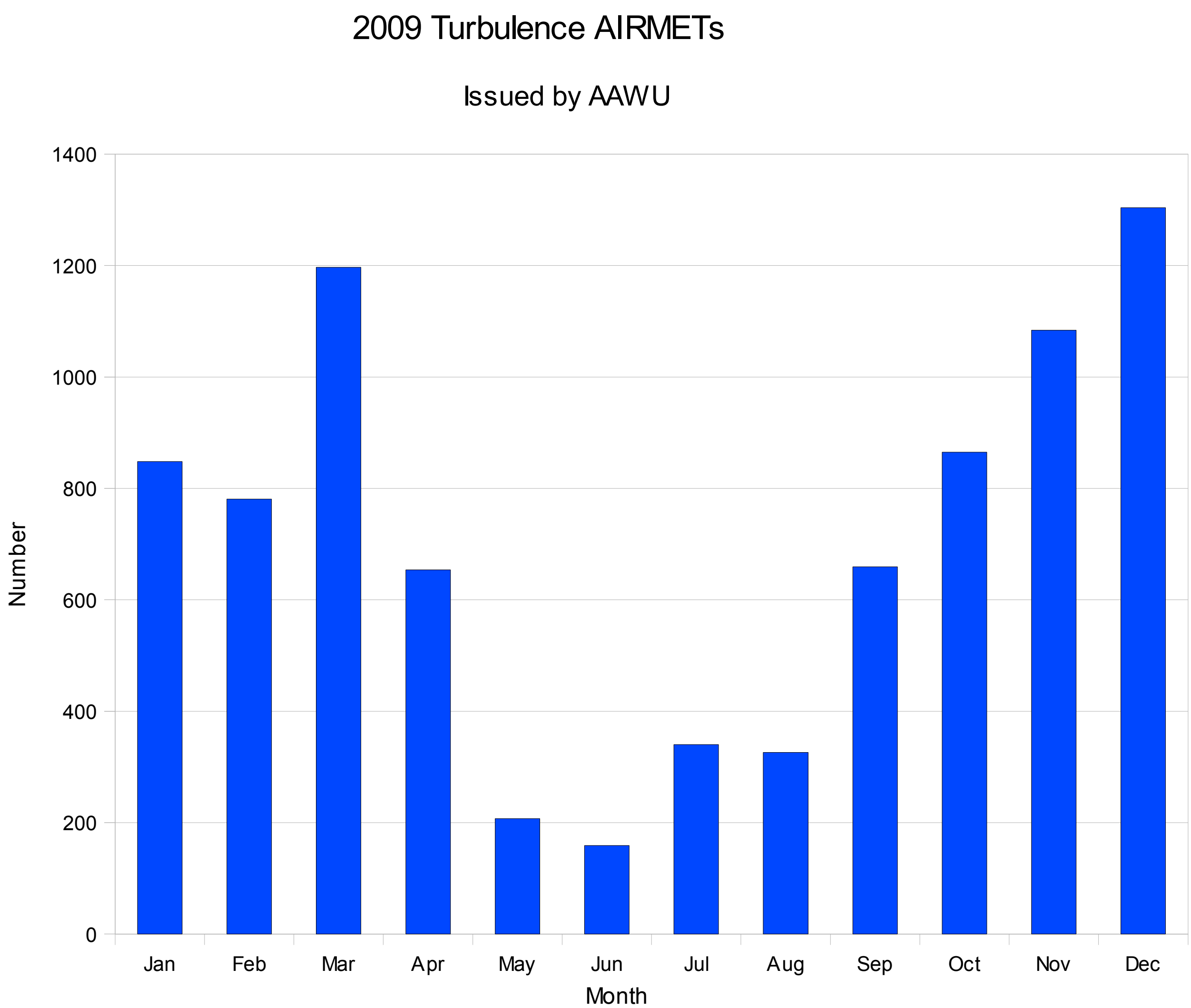
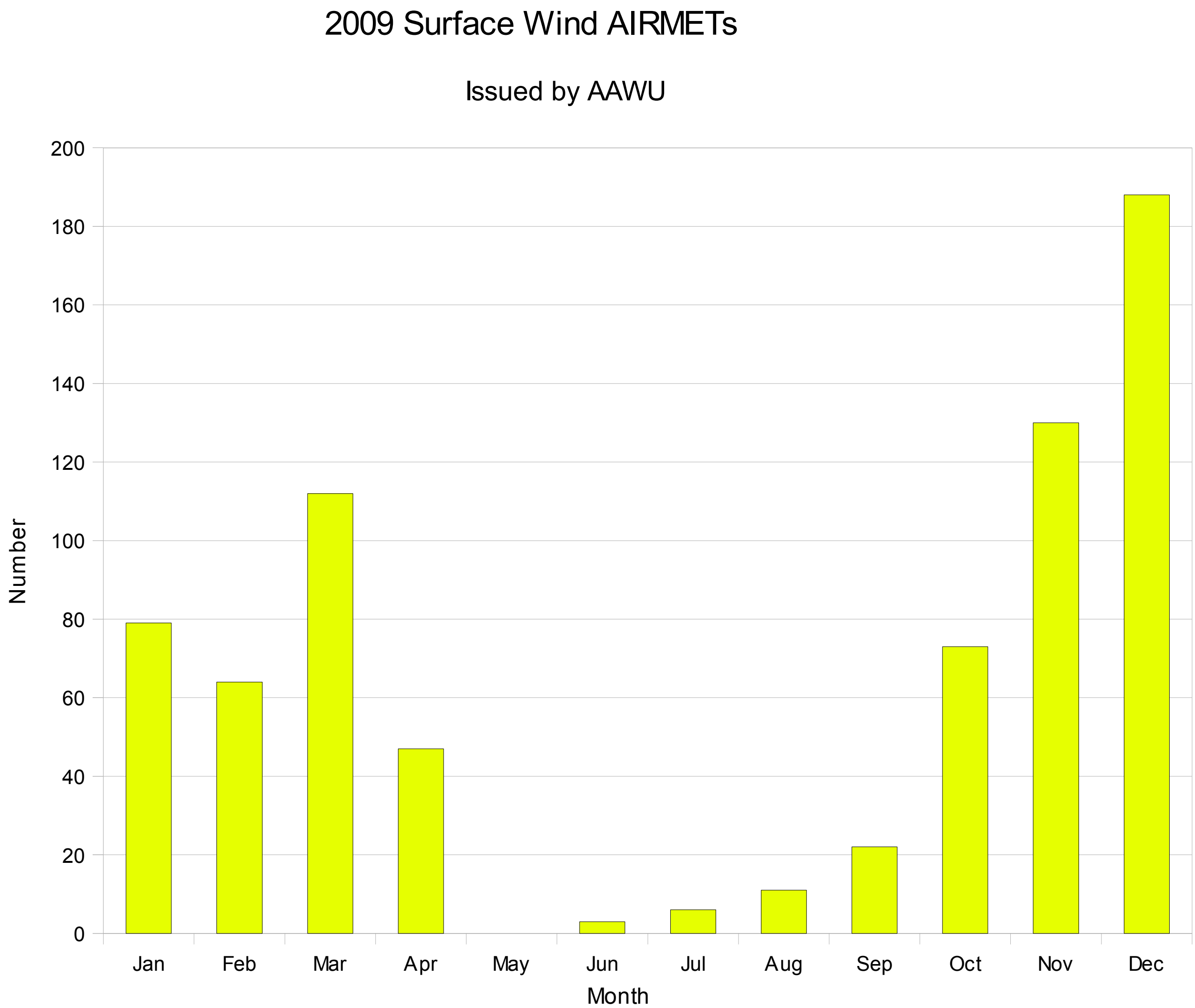
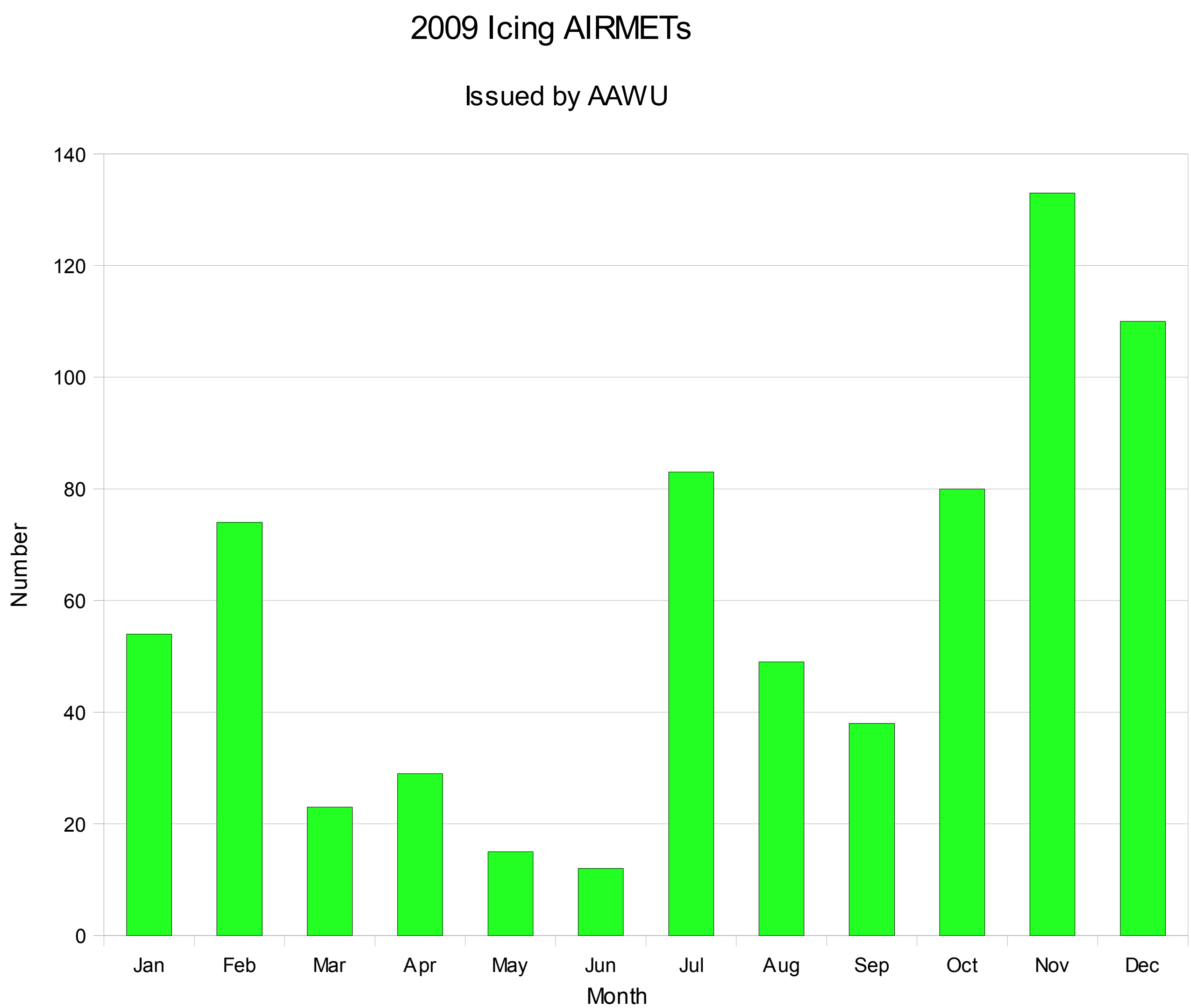


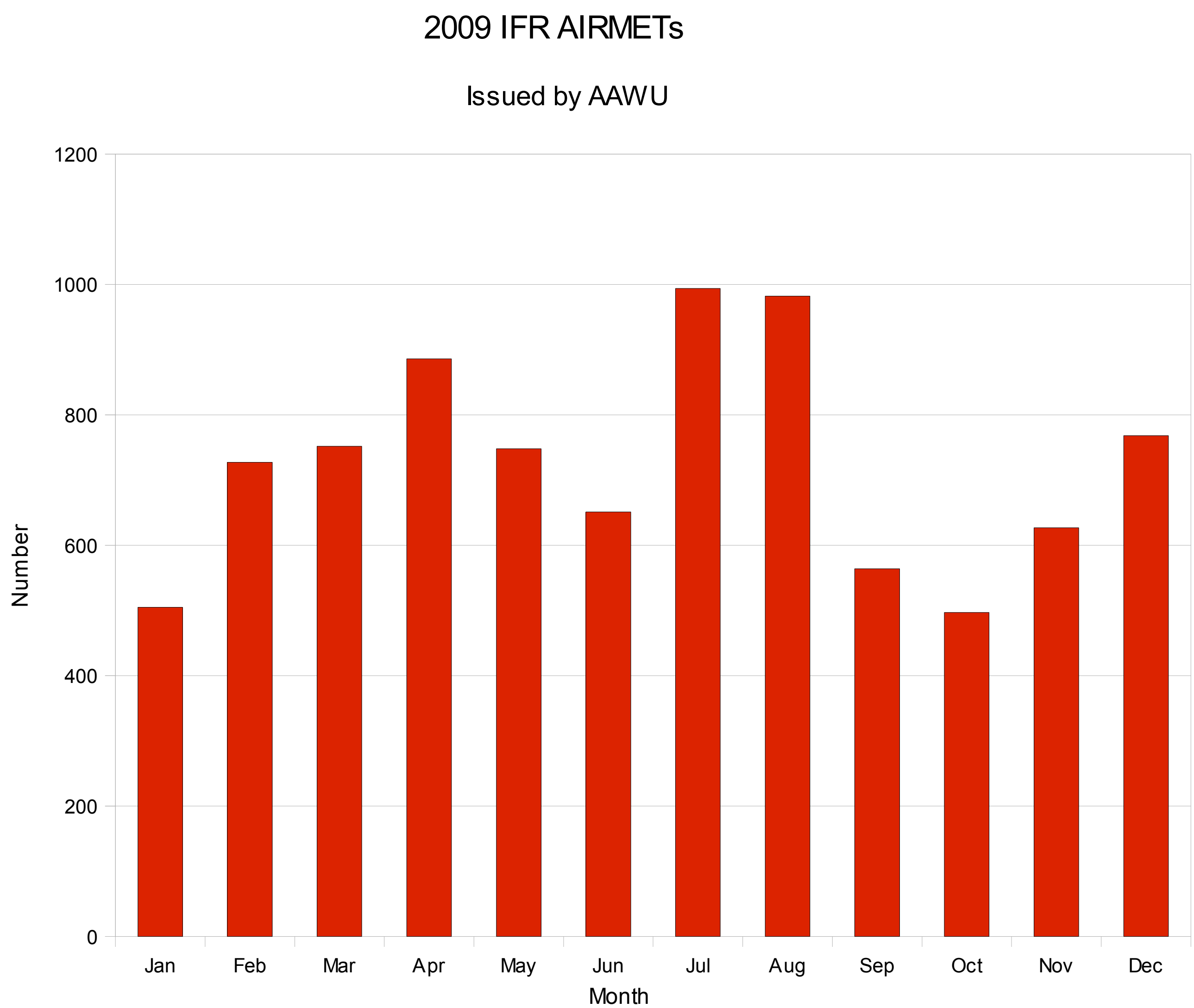
This graph illustrates the number of AIRMETs issued by the AAWU for turbulence in 2009 (monthly). As the graph suggests, there is a strong relationship between season and the frequency of these conditions. AIRMETs for turbulence were most common in March, November, and December, and least common in late spring and summer. For instance, over 1100 AIRMETs were issued in March, November, and December, while fewer than 400 AIRMETs were issued each month during the May-Aug period. This distribution reflects the climatological pattern of mid-level and upper-level winds in the Northern Hemisphere. Both height gradients and jet cores are typically enhanced in late fall and early spring due to greater thermal contrasts and differential heating.



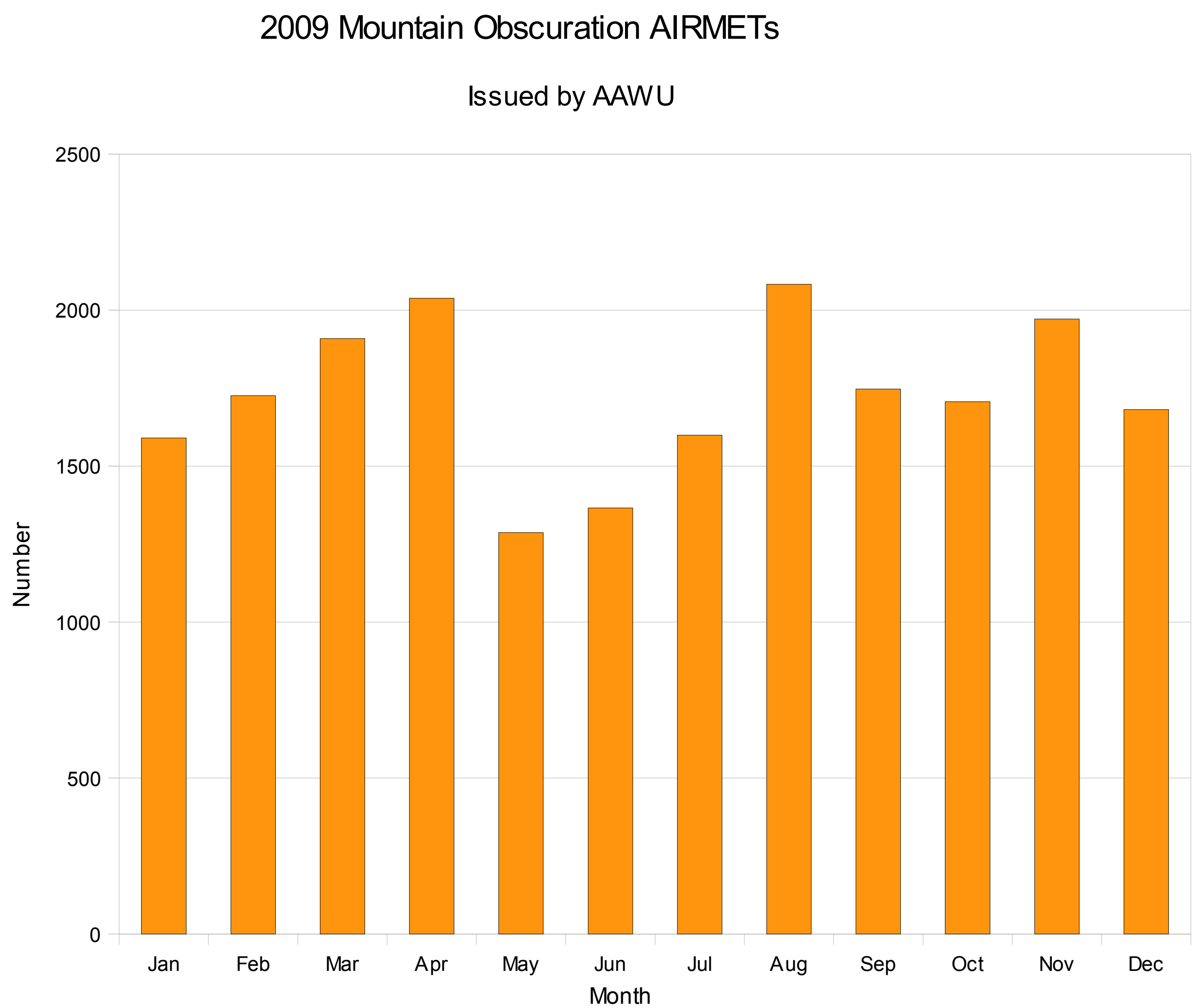
This graph illustrates the number of AIRMETs issued by the AAWU for strong surface winds in 2009 (monthly). As the graph suggests, there is a definitive relationship between season and the frequency of these conditions. AIRMETs for strong surface winds were most common during late fall, and extremely rare in late spring and summer. For instance, over 130 AIRMETs were issued in November and December, while fewer than 20 AIRMETs were issued each month during the May-August period. An additional maxima occurred in March, with over 110 AIRMETs. This reflects the climatological pattern of surface winds in the Northern Hemisphere. Pressure gradients and wind speeds are typically greatest in late fall and early spring due to larger thermal contrasts and differential heating.



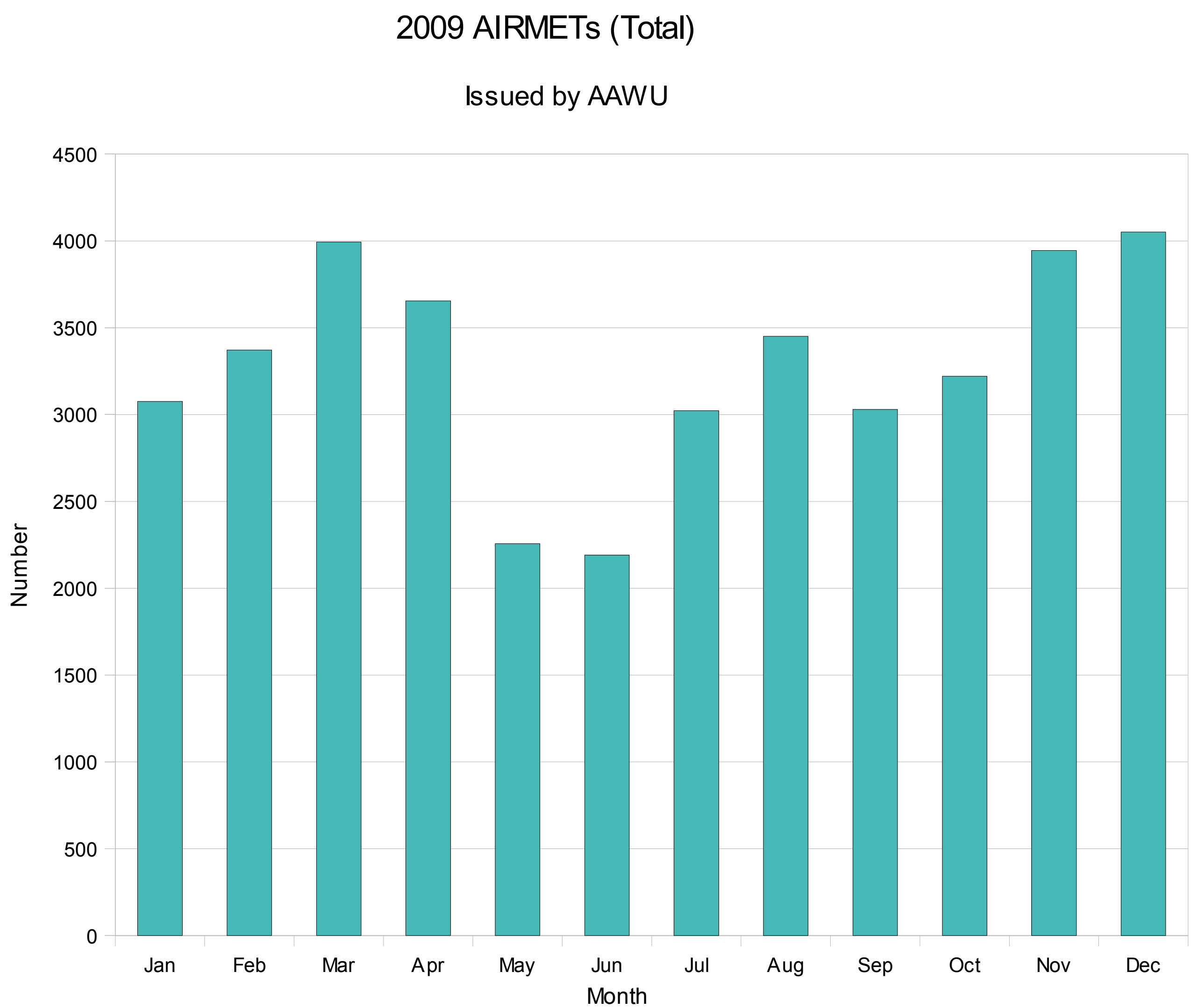
This graph illustrates the number of AIRMETs issued by the AAWU for icing in 2009 (monthly). As the graph suggests, there is a fairly strong relationship between season and the frequency of these conditions. AIRMETs for icing were most common during late fall, and least common in spring. For instance, over 100 AIRMETs were issued in November and December, while fewer than 30 AIRMETs were issued in March, April, May, and June. Though sub-freezing low-level air temperatures in late fall and winter favor significant icing, large climatological differences in relative humidity between late fall and late spring are likely most responsible for this discrepancy. Interestingly enough, the number of AIRMETs increased dramatically between June and July. This phenomenon may have been influenced by a rise in convective activity during mid-summer.



This graph illustrates the number of AIRMETs issued by the AAWU for IFR in 2009 (monthly). As the graph suggests, there is a unique relationship between season and the frequency of these conditions. AIRMETs for IFR conditions were most common in late summer, with other maxima in December and April. This complex pattern may be explained by the seasonal variability in IFR frequency across different regions. For example, the April and July-Aug maxima reflect the significant increase in IFR conditions near the Bering Sea (late summer) and along the Arctic Coast (spring through summer). The December maximum reflects the increase in IFR conditions for much of south-central Alaska and the interior (winter).



This graph illustrates the number of AIRMETs issued by the AAWU for mountain obscuration in 2009 (monthly). The monthly variability appears to follow a pattern similar to that of the IFR distribution. AIRMETs for mountain obscuration were most common in April, August, and November. This correlation between IFR and mountain obscuration can be partially explained by the physical relationship between the two. IFR conditions often require cloud ceilings below 1000 ft, which would be expected to cause mountain obscuration near any mountain range in Alaska.



This graph illustrates the total number of AIRMETs issued by the AAWU in 2009 (monthly). As the graph suggests, there is a bimodal distribution in the monthly variability of AIRMETs. The greatest number of AIRMETs were issued during March and the Nov-Dec period (over 3900 each month), whereas the fewest AIRMETs were issued in May and June (less than 2300 each month). This distribution is very similar to the distribution represented in the mountain obscuration graphic, mostly due to the fact that mountain obscuration accounted for more than 50% of all AIRMETs in 2009. The monthly variability of turbulence AIRMETs also appeared to be a significant factor. Specifically, the very high frequency of turbulence in March, November, and December, combined with the very low frequency of turbulence in May and June, helped cause the large discrepancy in total AIRMETs.