Reply

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We are grateful for the useful information on Phoenix wind measurements provided by Cherry (1988). His detailed description of the anemometer exposures should be included in any future research on wind speed trends in the Phoenix area. We regret not being aware of his two reports issued in New Zealand in 1985.

However, his comments do not change our fundamental conclusion regarding a relationship between wind speeds and the growing heat island in the Phoenix area. The data presented in his Fig. 3 actually provide further support for our contention. Cherry shows that between 1961 and 1975, the anemometer at the airport remained fixed at 5.5 m above the ground. A trend line through the mean annual wind speeds of this lengthy period reveals a highly significant correlation coefficient of 0.72. If the questionable data entry for 1962 is eliminated, the correlation coefficient moves upward to 0.75. Both of these correlation coefficients are higher than any comparative value calculated in our 1948 to 1985 study period.

Diurnal wind speed and temperature patterns discussed in our original paper provide additional support for our conclusions regarding circulation responses to the Phoenix urban heat island. The morning (0500 LST) urban heat island (represented by the spatial temperature gradient between Phoenix and Wickenburg) was substantially larger than the pattern observed during the afternoon (1400 LST) hours. Correspondingly, the early morning wind speeds in Phoenix increased much more rapidly than those during the afternoon period. Exposure differences described by Cherry do not explain the significant differences in wind speed responses at these different hours of the day.

Our initial analyses, coupled with information gleaned from Cherry's presentation, reinforce our original conclusions. We remain firmly convinced that wind speeds in Phoenix have increased in response to the growing heat island.

REFERENCE