TEMPERATURES AND HURRICANE FREQUENCY

By

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Prior to the Atlantic-Gulf "hurricane season" of 1968, there was a widely published news release which indicated the probability of an abnormally large number of hurricanes during that year. Actually, there were fewer than normal. Whatever the basis for the forecast may have been, there was some evident need for revision. Although meteorology is certainly not the forte of this writer, the inaccuracy of the forecast did arouse his interest and curiosity to the extent that he has devoted a little thought to the matter of hurricane frequency.

In view of the seasonal nature of hurricanes, there seems to be little doubt as to the role of temperatures or differences in temperatures in determining hurricane occurrence. Consequently, it seems that the development of a frequency forecasting procedure should start with a study of temperatures. If this approach is taken, the immediate question becomes that of identifying the temperatures which are significant to the study.

The temperatures which might be of some significance appear to be the air and water temperatures in the regions in which disturbances are generated and in the broad expanses within which hurricanes travel, as well as air temperatures over the continental land mass. The initial disturbances, which may be generated at great distances from the North American continent, may be somewhat like small scale disturbances within a flowing fluid in that they may be damped out or may develop an eddy or vortex motion, depending upon the conditions into which the disturbances move.

A comprehensive study of the problem would require data, staff and facilities far more extensive than those available to this writer. However, this does not preclude a little probing. It may be that disturbances are generated with some degree of regularity and that their growth into hurricanes depends, to a great extent, upon temperatures over the continental land mass.

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Out of curiosity as to whether a record of temperatures at a single continental station that was arbitrarily, but not aimlessly, chosen would exhibit any relation to hurricane frequency, this writer requested and received Weather Bureau records of average monthly temperatures at Jackson, Mississippi, for the period 1910 to 1968, inclusive. These data are presented through Fig. 1, with the hope that they may shed some light on the relations, if any, that may exist.

The graphs of Fig. 1 were constructed by connecting points representing (a) The average temperature in December, January and February preceding the "hurricane season," (b) The number of tropical cyclones, (c) The number of hurricanes and (d) The difference between the extremes of summer and winter temperatures preceding the "hurricane season," for each year within the period for which data were available.

Although the graph (a) is certainly not identical to graph (b) or graph (c), there are some intriguing aspects of comparison. The graph (d) appears to exhibit some tendency to be out of phase with graph (b) and graph (c). That is, depressions in graph (d) appear to have some association with peaks in graph (b) and graph (c), and vice versa. Any further analysis of the graphs is left to the reader and his imagination.

The purpose of this presentation is to suggest that a reliable method of forecasting hurricane frequency, and perhaps more, might be developed from an analysis of temperatures. The data presented through Fig. 1 were included for no other reason than to provoke some thought on the matter. That is, no general quantitative significance is intended.

Acknowledgment

The data presented through Fig. 1 were obtained from the Weather Bureau, Jackson, Mississippi, and the National Hurricane Research Laboratory, Coral Gables, Florida, both of the U. S. Department of Commerce.

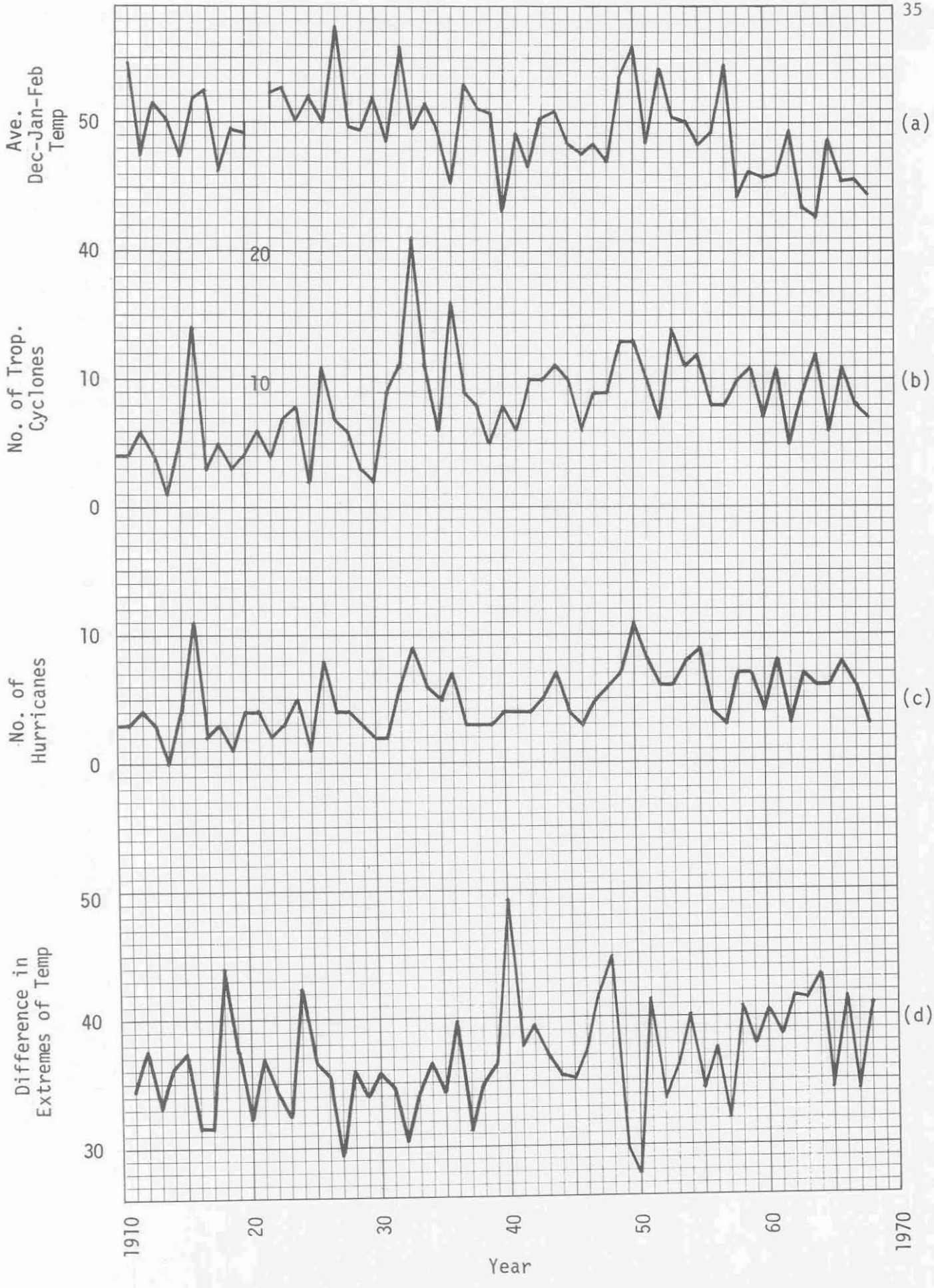

Fig. 1 - Comparison of hurricane and tropical cyclone frequencies with temperature conditions at Jackson, Mississippi