

MASTER OF SCIENCE IN METEOROLOGY

EXTENSION OF THE SYSTEMATIC APPROACH TO TROPICAL CYCLONE TRACK FORECASTING IN THE EASTERN AND CENTRAL NORTH PACIFIC

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This study extends an earlier study (White 1995) of the application of the systematic approach to tropical cyclone track forecasting of Carr and Elsberry to the eastern and central North Pacific, and contrasts these cases with those in the western North Pacific. The data sample is first expanded to seven years (1990-1996). Modifications to the environment structure conceptual models are: (i) introduction of two dominant ridge synoptic regions named Ridge Poleward and Ridge Equatorward based on the bowed orientation of the subtropical anticyclone; and (ii) combining the Weak Westerlies and Accelerating Westerlies into just one synoptic region called Midlatitude Westerlies. Only eight synoptic pattern/region combinations are needed to classify all of the 1,858 cases. Additions to the transitional mechanisms include: (i) the formation and dissipation of the mid-level low; (ii) monsoon trough formation; and (iii) orography. A new transition climatology reveals that a large fraction of transitions occur between the regions of the standard pattern. Subtropical Ridge Modulation and Vertical Wind Shear are determined to be the most important transitional mechanisms. Synoptic analysis sequences are provided to illustrate the synoptic pattern/regions and the primary transitions.

KEYWORDS: Tropical Cyclone Track Forecasting

DoD KEY TECHNOLOGY AREA: Battlespace Environments