

ABSTRACT

THESIS: The Impact of the Atlantic Meridional Mode (AMM) on North Atlantic Tropical Cyclone Activity

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In prior studies, a number of teleconnections have been shown to impact tropical cyclones within the North Atlantic. These teleconnections include the Atlantic Meridional Mode (AMM), Atlantic Multidecadal Oscillation (AMO), El Niño – Southern Oscillation (ENSO), North Atlantic Oscillation (NAO), and the Madden Julian Oscillation (MJO). This research focuses on how the AMM impacts North Atlantic tropical systems from June 1st to November 30th (the official North Atlantic hurricane season). Statistical methods (e.g. Pearson's/Spearman's correlation, regression tests, normality tests) are used to analyze storm track, landfall locations, and intensity to all the phases (normal and extreme) of the AMM between 1992 and 2012. Graphical methods are also used to show the variability within the AMM and to analyze any relationships between the storms and the AMM. Maps of tropical system tracks and landfall locations were compiled in ArcGIS to examine the average storm paths by using the linear directional mean and directional distribution statistic methods. Correlation tests are used to compare the average AMM values during the North Atlantic hurricane season and the parameters (e.g. strength, frequency, genesis location) and total number of the storms. These analyses shows

the AMM to have some influence on the frequency and intensity of tropical cyclones during the North Atlantic hurricane season, but shows no strong relation to the landfall locations.