

# Frequency of Winter Weather Regimes in the US Northeast as an Indicator for National Climate Assessment

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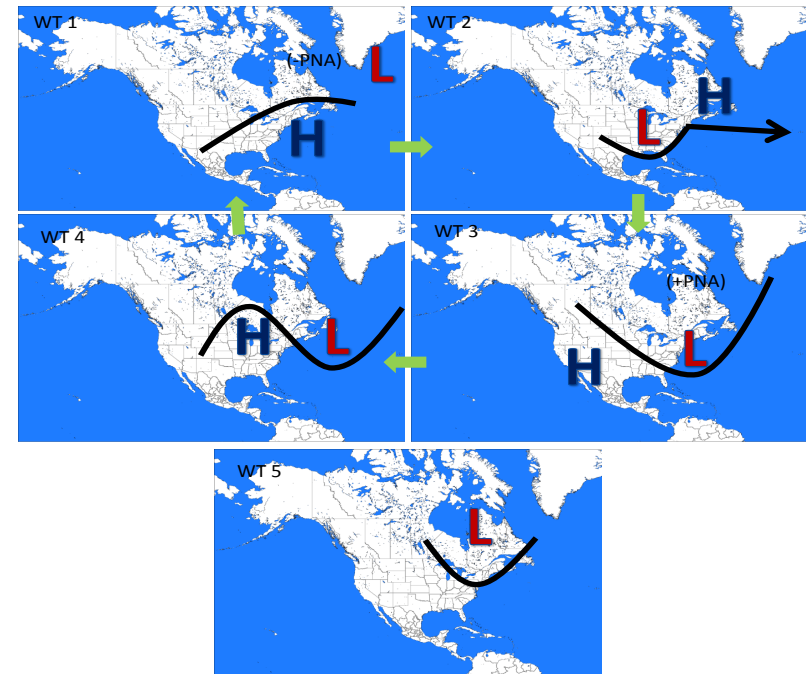
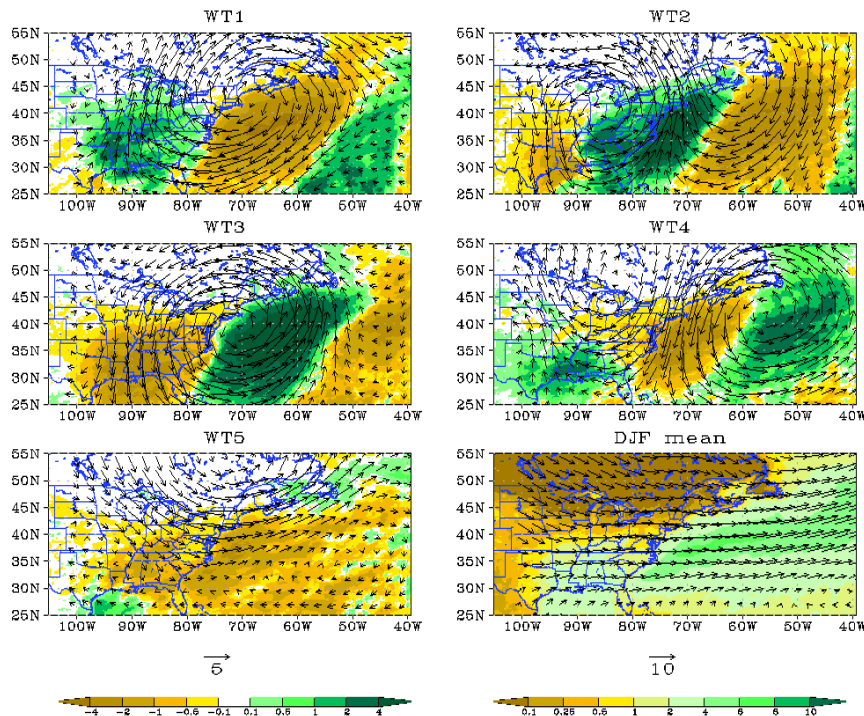
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**NASA NCA**



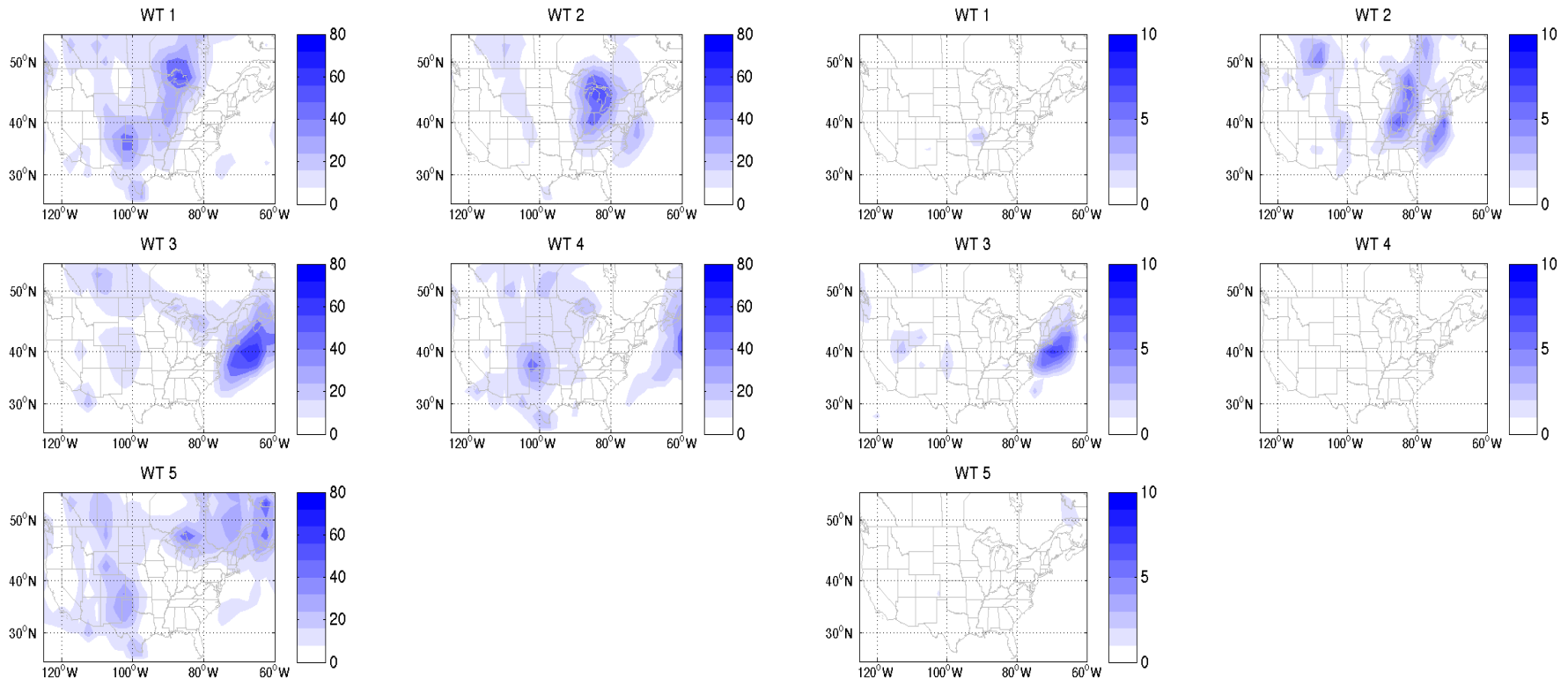
# Anomalous precipitation & 850 hPa wind for the 5 winter WTs

Based on the NASA MERRA reanalysis data, five typical daily winter weather types (WTs) have been found in the Northeast U.S., in which two WTs are corresponding to extreme weather and closely related to the energy usage in the Northeast US.



Anomalous CMORPH (2003–2010) precipitation WT1–5 (mm/day; shaded)  
and MERRA reanalysis winds at 850 hPa (m/s).

# Storm Tracks Corresponding to the 5 Weather Types (WTs)



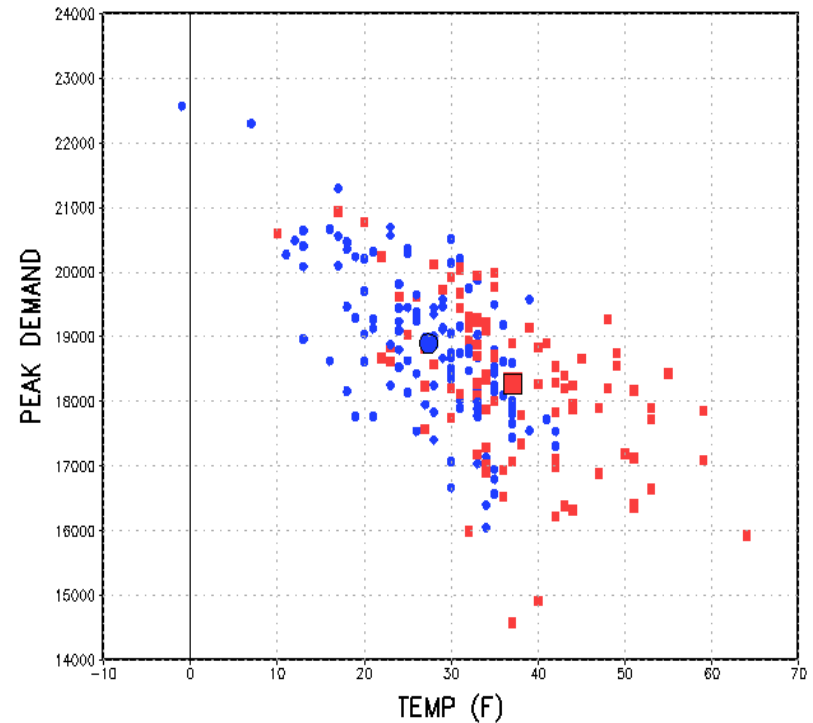
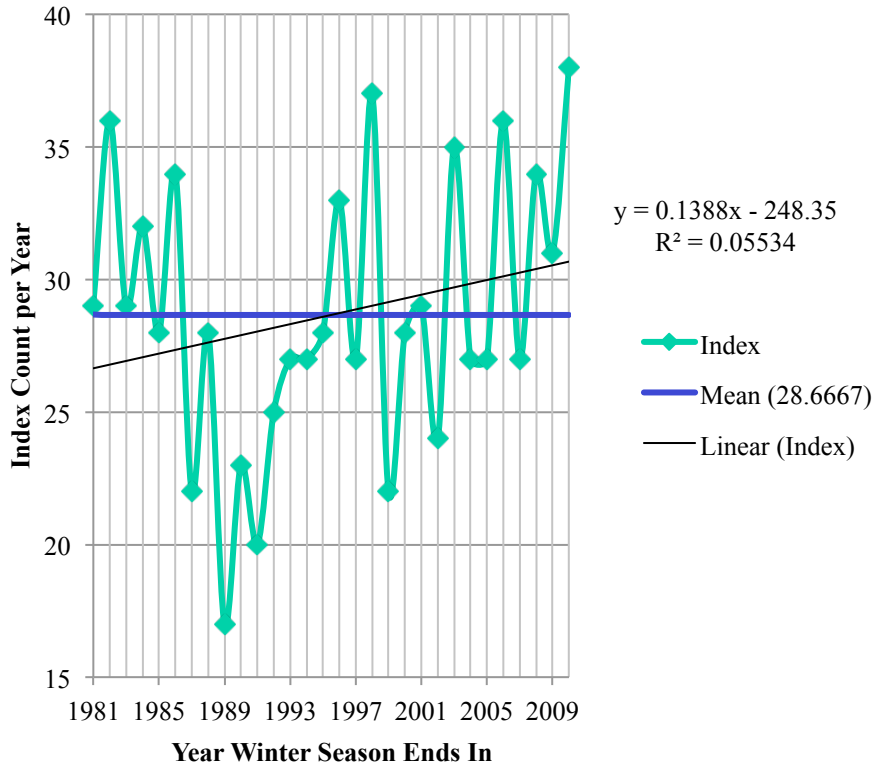
Storm track density for WTs on DJF days with precipitation at any of 35 USHCN stations (Fig. 7). The density is a cumulative count of storm center locations (based on 6-hour track locations). Precipitation data from 1980-2008.

Same as the left figure, except on DJF days with extreme precipitation (top 1% of precipitation daily intensity) at any of the 35 USHCN stations.

WT2 and WT3 are the extreme WTs.

# Total Frequency of Extreme Weather Types (WT2 & WT3)

## Index over Winter Season



Temperature vs energy usage in the Northeast U.S. for WT2 (red) and WT3 (green). Large mark is average.

The Frequency of extreme weather types WT2 and WT3 can be used as an climate indicator for energy usage and in other sectors such as transportation and urban infrastructure vulnerability.