Figure S1. U.S. seasonal soil moisture anomalies (mm) during the 12-month period antecedent to the occurrence of dry May-August conditions over the central Great Plains during 2012 (lower right panel). Soil moisture has been estimated by driving a one-layer bucket water balance model with observations of monthly temperature and precipitation. The data set spans 1948-present, and the method is described in Huang et al. (1996).

Figure S2. Composite U.S. seasonal precipitation anomalies (mm) during the 12-month period antecedent to the occurrence of dry May-August conditions over the central Great Plains during historical droughts. Based on the average of the 9 driest May-August events during 1895-2011, including 1934, 1936, 1901, 1976, 1913, 1988, 1953, 1911, and 1931. Data source is the NOAA U.S. Climate Divisions.

Figure S3. (top) Observed climatological May-August 700 hPa specific humidity (left, g/kg) and 700 hPa meridional wind magnitude (right, m/s). (bottom) Anomalous May-August 2012 700 hPa specific humidity (left. g/kg) and anomalous 700 hPa meridional wind magnitude (right, m/s). Data source is the NCEP/NCAR reanalysis. Departures are relative to a 1981-2010 reference.

Figure S4. The linear correlation between an index of observed May-August U.S. central Great Plains summer rainfall (see Fig. 6) and May-August surface temperatures. Period of analysis is 1895-2011. Statistically significant correlations are confined to the central U.S. where there is a strong inverse correlation between

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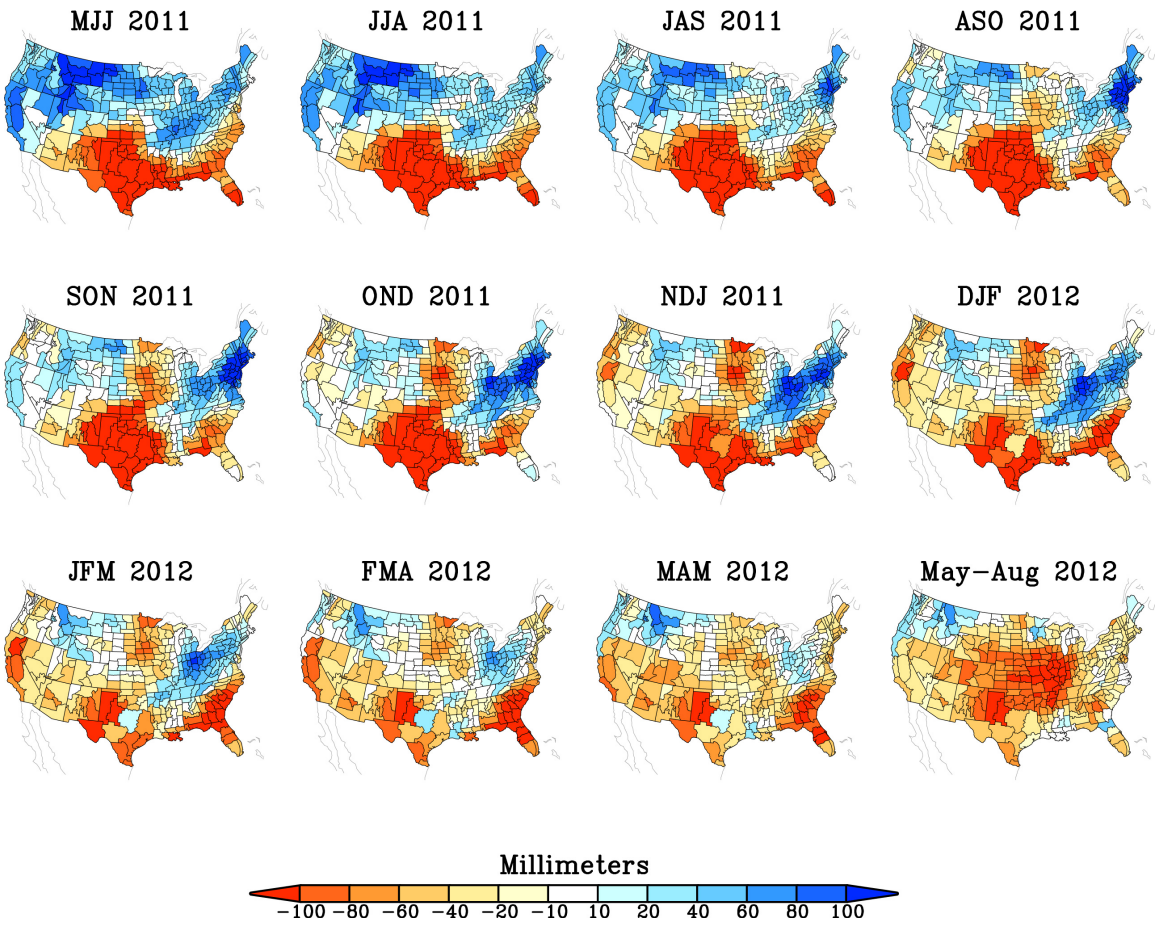

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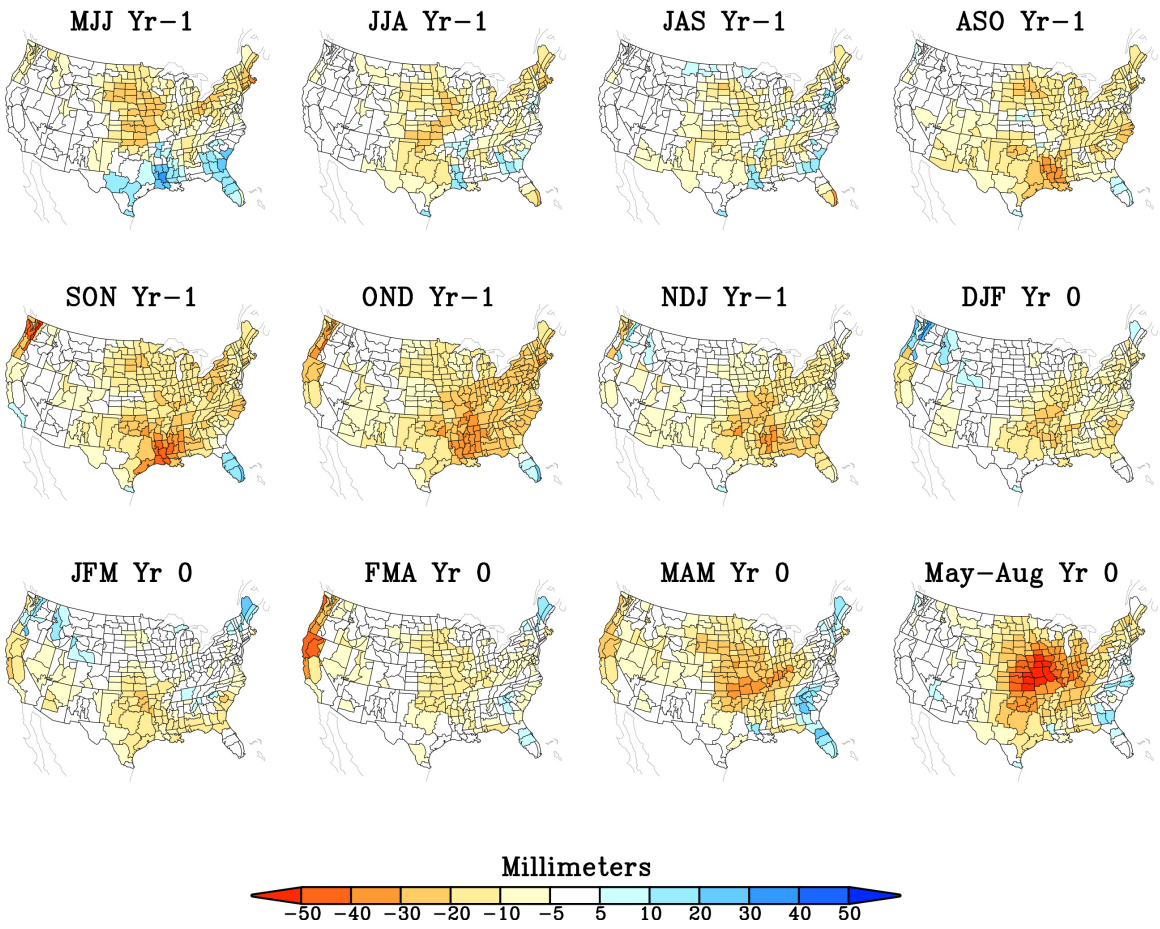

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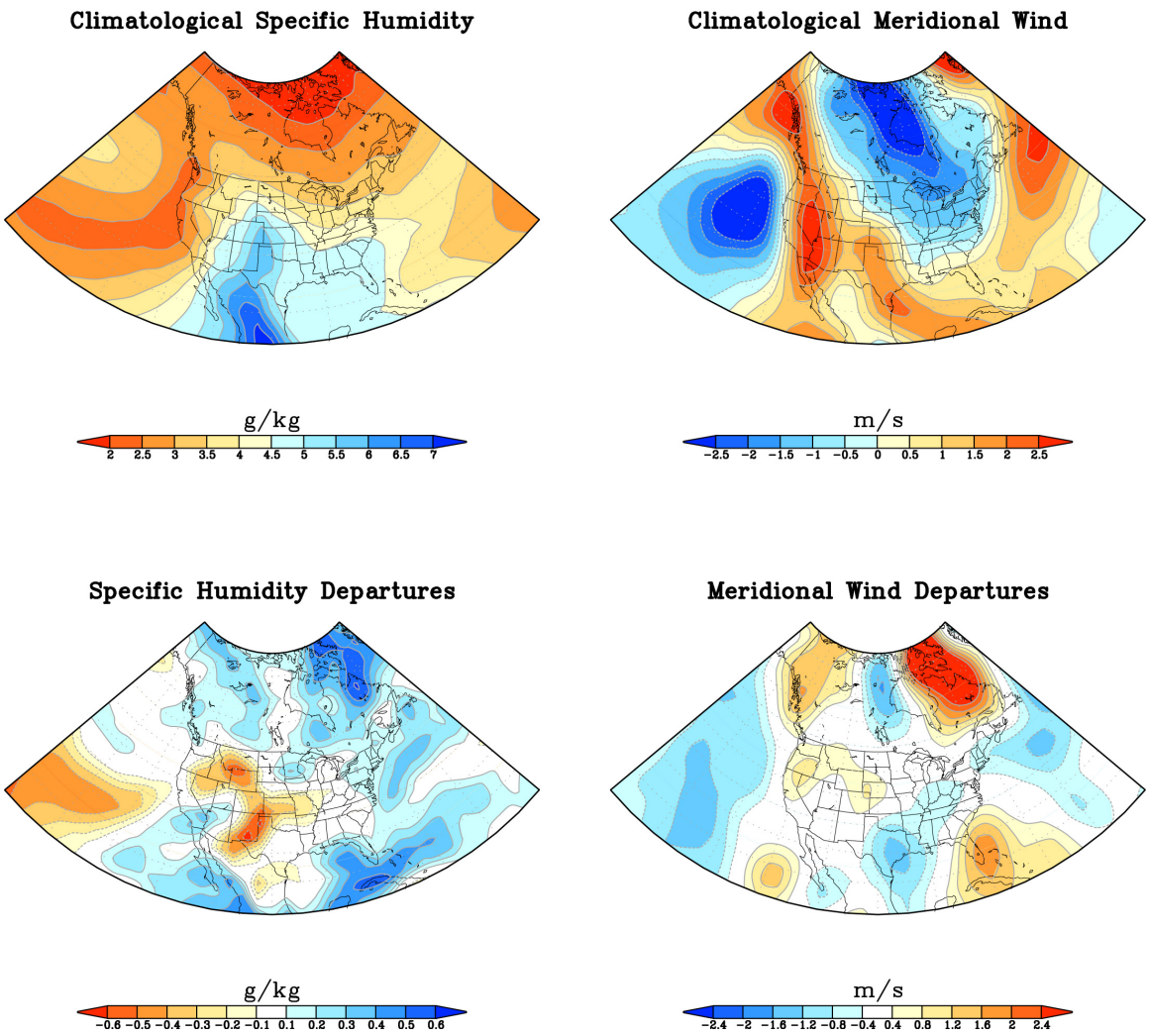

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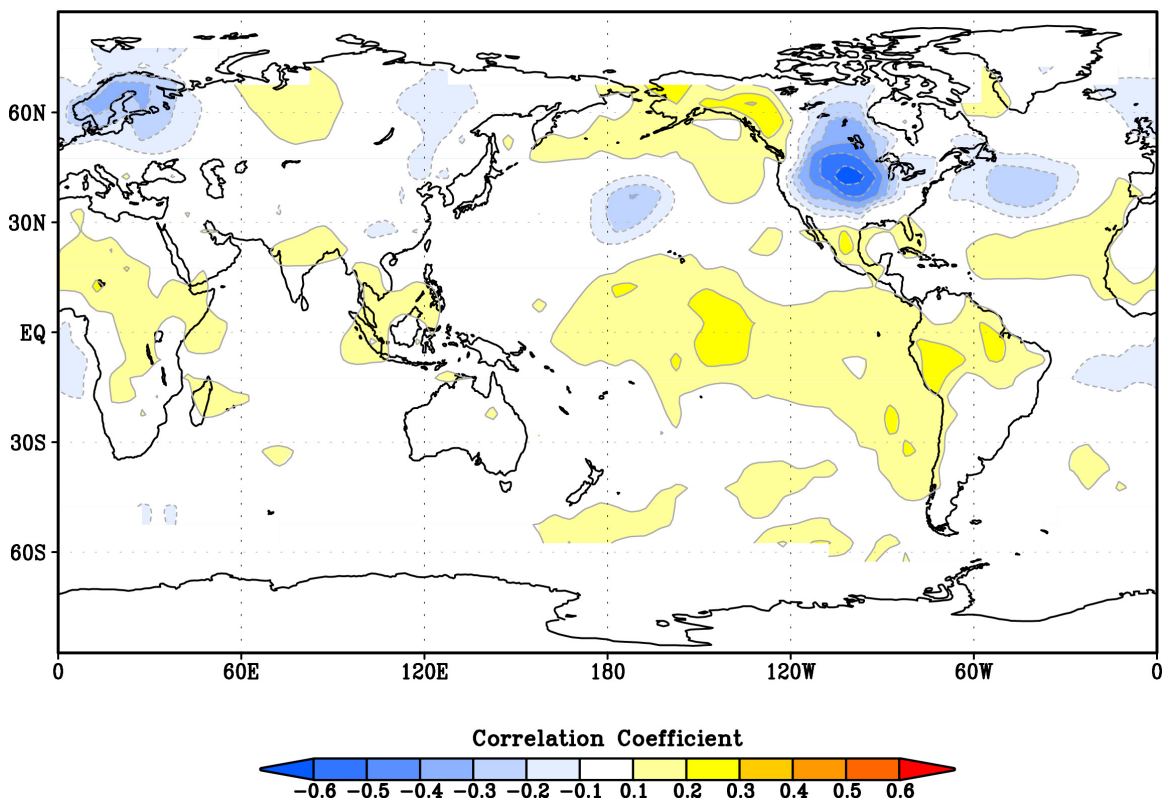

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