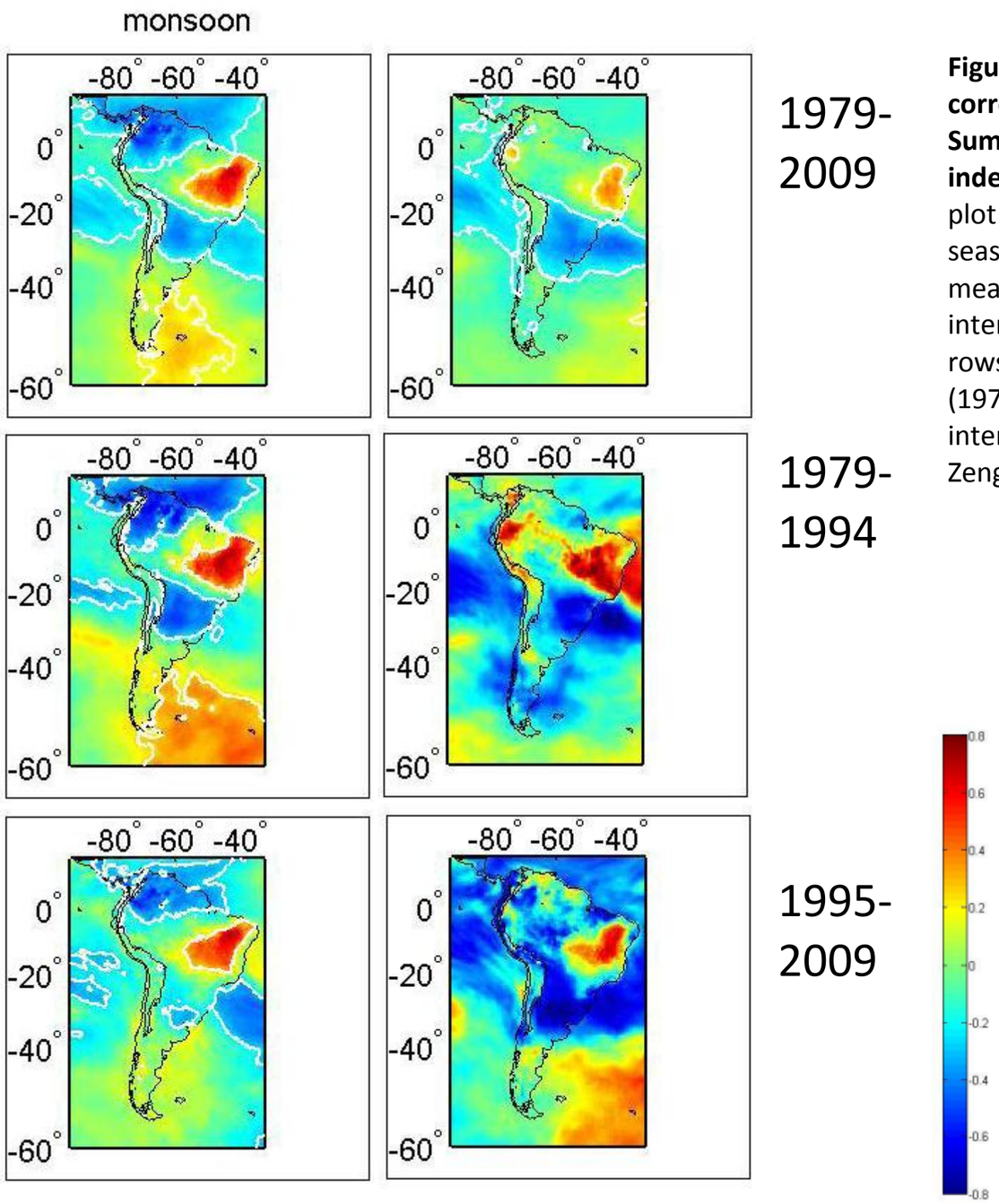

Figure 4. Humidity anomalies correlated against South American Summer Monsoon Index (SASM) index by season. The top row of each plot shows correlations between seasonal humidity anomalies and mean gradient over the entire study interval (1979-2009). Subsequent rows show correlations for the earlier (1979-1994) and later (1995-2009) intervals. SASM index after Li and Zeng (2002, 2003, 2005).

Explanation:

In my thesis, I used satellite-acquired temperature and humidity data to show how climate patterns are changing in South America, and especially how that relates to the ENSO (El Nino) and the South American Monsoon.

I wrote MATLAB code to read the satellite data, perform principal components analysis, and generate these maps. These maps were generated using only MATLAB.

Figure 3 shows the degreening of South America just in the last 30 years.

In Figure 4, blue areas are wet during monsoon years; red areas are dry. The top row shows areas that have been historically wet or dry during monsoon years. Subsequent rows show how those tendencies have changed just in the time between 1979 and 2009.

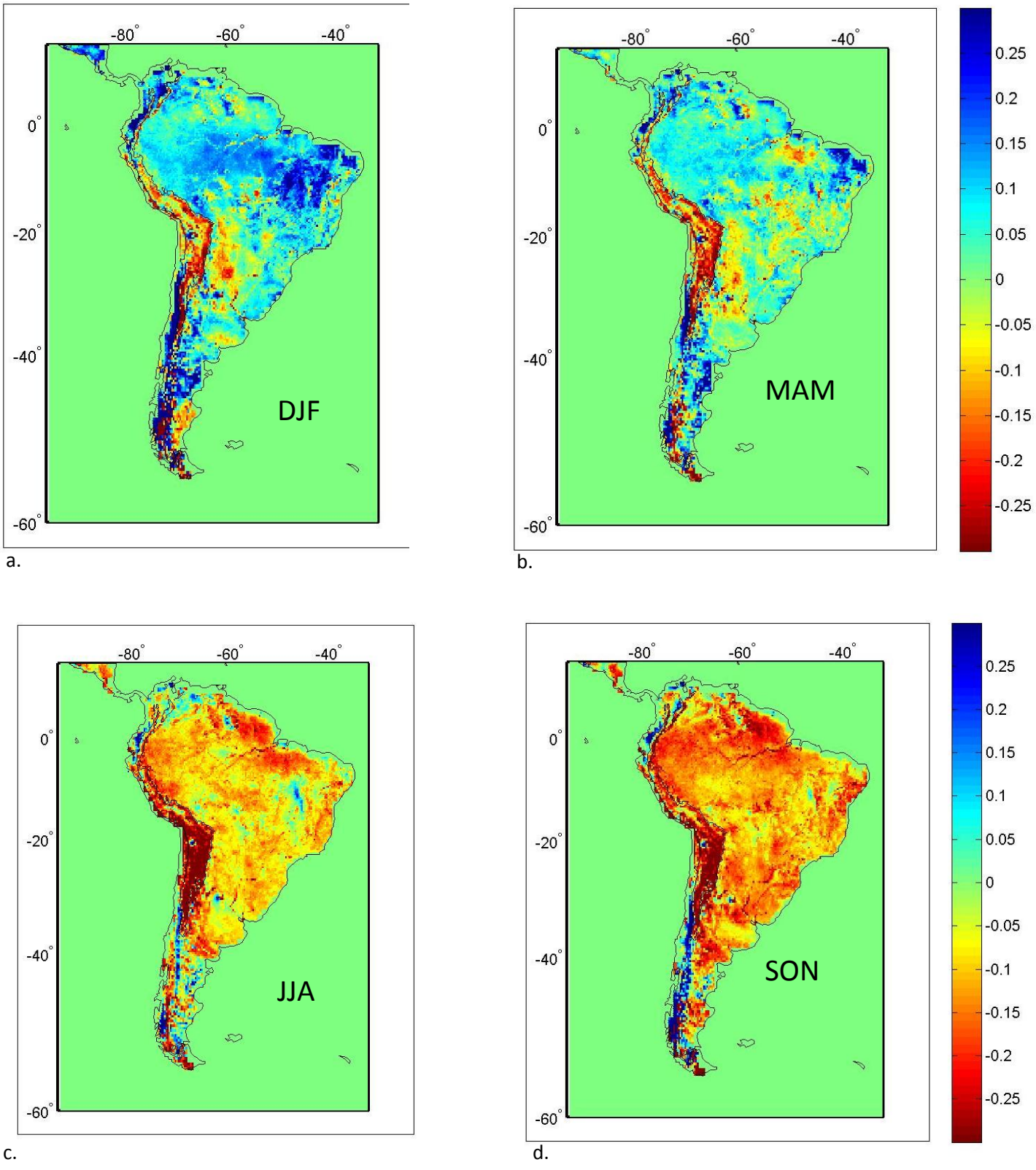

Figure 3. Percent change in NDVI vegetation index, 1979-1994 and 1994-2009.
Blue represents an increase in vegetative "greenness"; red, a decrease in greennessbetween the two intervals. [(mean 1995-2004)-(mean 1979-1994)]/(mean 1979-1994). White circles enclose areas of change that are statistically significant at 95%.