OCO-2 Solar-induced Chlorophyll Fluorescence Variability across Ecoregions of the Amazon Basin and the Extreme Drought Effects of El Niño (2015–2016)
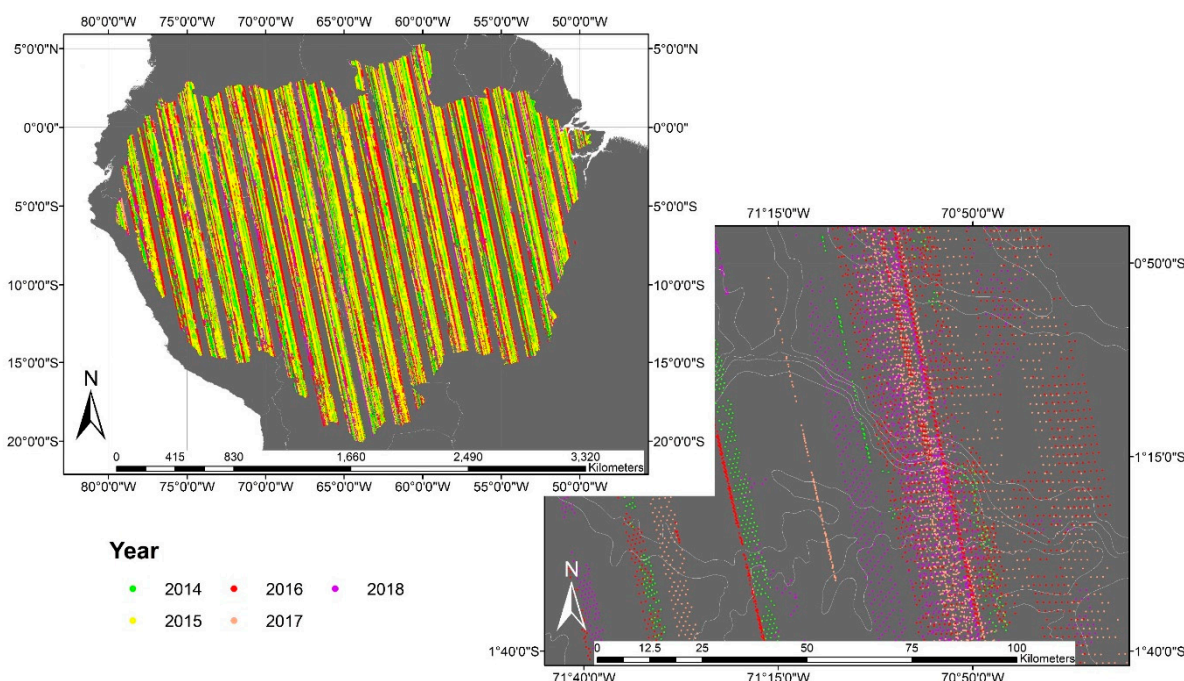

Figure S1. Sun Induced Fluorescence retrievals (OCO-2 Science Team, 2018) inside the Amazon river basin extent of Mayorga et al (2012).

A total of 2543447 SIF retrievals were available for the period September 2014 – November 2018 for the Amazon river basin. SIF retrieved at a wavelength of 757nm (SIF_{757}) is used in this study. We removed non-forest or disturbed forest areas were and had 1687662 retrievals left from undisturbed forest areas.

For each area and time period retrieval, the OCO-2 product includes an uncertainty range for each bandwidth. The uncertainty varied from 0.114 to 0.696 $W/m^2/sr/\mu m$ within the study area. In this study, a minimum threshold of 0.45 $W/m^2/sr/\mu m$ is used to increase the accuracy by 35.34% (0,246 $W/m^2/sr/\mu m$) by filtering out 10.14% of the samples. This resulted in 1516494 samples with an uncertainty less than or equal to 0.45 $W/m^2/sr/\mu m$. However, as the drought data for the analysis of El Niño phenomena is available for the period September 2014 to December 2016, in cases when SIF and drought data are combined, there are 895068 retrievals.
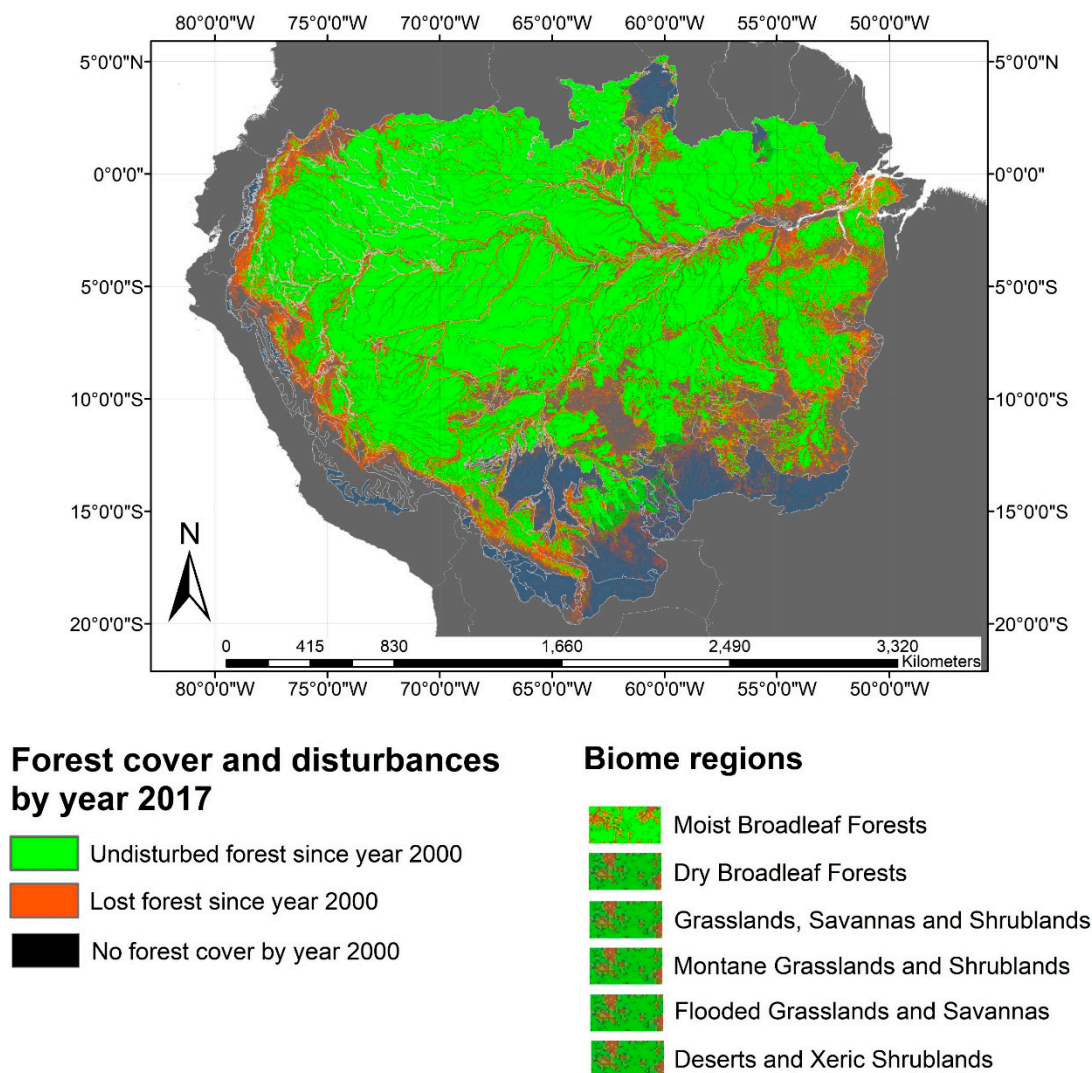
Figure S2. Forest cover and disturbances inside the Amazon river basin extent of Mayorga et al (2012). Based on the "Tree canopy cover for year 2000" (treecover 2000) and "Year of gross forest cover loss event" (lossyear) of the Global Forest Change products of Hansen et al. (2013), respectively.
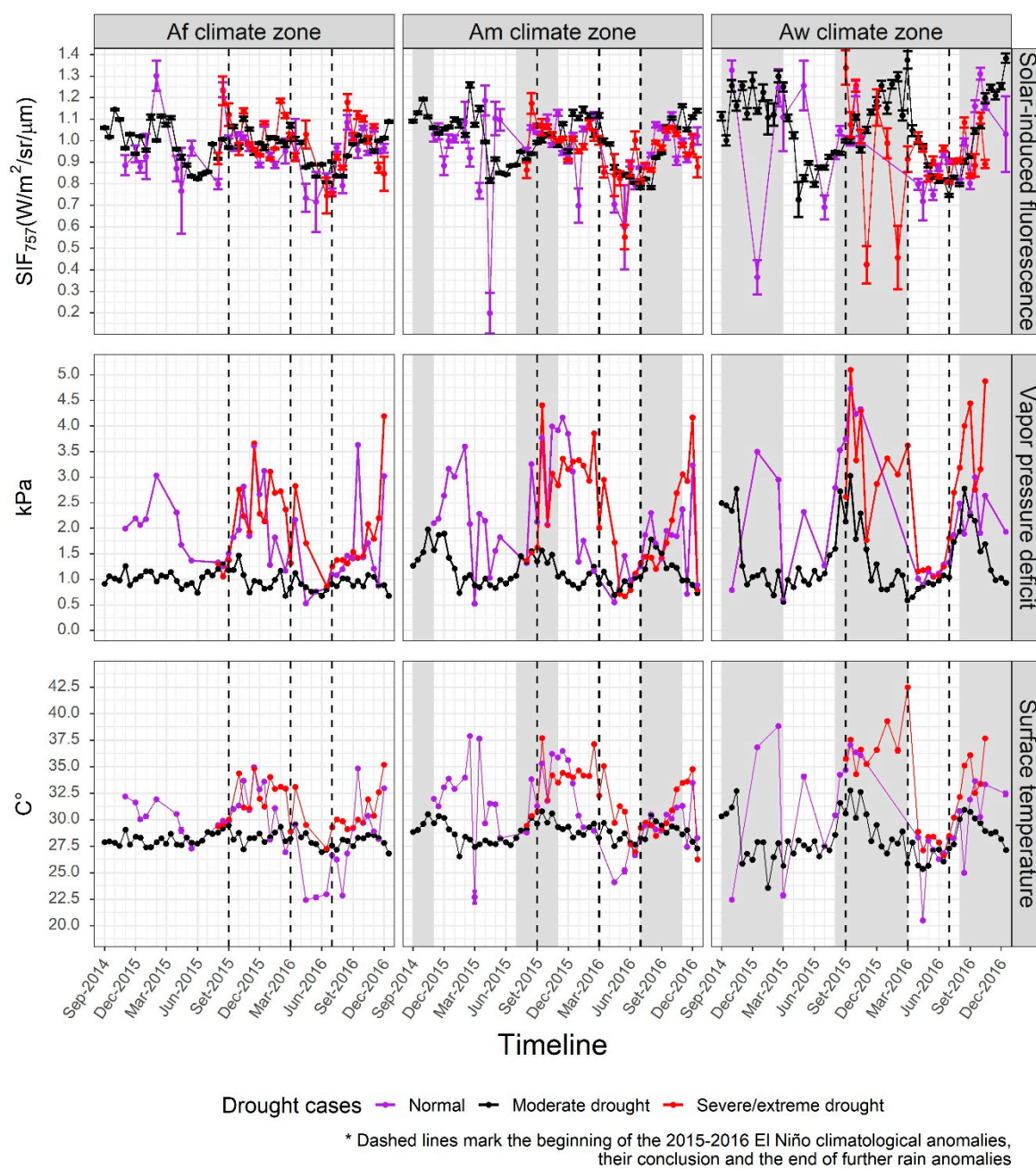
Figure S3. SIF757 averages and standard error; vapor pressure deficit, and temperature averages, for normal and drought scPDSI conditions at sub-regions of the Af, Am and Aw Köppen-Geiger climate zones within the moist broadleaf forest biome for the baseline period.