Climate change is leading to an increasing in the frequency and intensity of extreme weather events, which significantly affect ecosystems stability. In this study, ecological stability metrics in response to wet/dry events and warm/cold events on vegetation greenness were assessed using an auto-regressive model of NDVI in the Mekong River basin (around 759,000 km²) where large ecological and climatic gradients exist. Gridded temperature, and the Global Standard Precipitation Evaporation Index (SPEI) and antecedent NDVI were used as model predictors. The forest in north Laos was more resilient to the temperate and wet/dry anomalies events than other regions in the basin. Drought reduced green biomass in north Laos, northeast Thailand and Myanmar, but in these tropical climate regions' the vegetation biomass was also more responsive by higher temperatures. Vegetation in northeast Thailand, Cambodia and the Mekong delta were less sensitive to the temperature anomalies effect compared to other part of Mekong River basin. The map of resistance and resilience metrics can help to determine the most vulnerable regions to extreme events for policy makers.