A variety of remote sensing derived vegetation indices have been used to assess vegetation conditions, and therefore indicate drought occurrences and evaluate drought impacts. Here, we used Moderate Resolution Imaging Spectroradiometer (MODIS) 8-day composite data to compute the Modified Soil Adjusted Vegetation Index (MSAVI) of four dominant vegetation types over a decade on the San Carlos Apache Reservation in Arizona, US. We generated MSAVI anomalies to further tease out adverse impacts of drought on vegetation. We found similar responses between grasslands and shrublands, and for woodlands and forests land cover types. We compared the vegetation type specific MSAVI with precipitation data at the same time step, and found a lag time of roughly two months for the peak MSAVI values following precipitation in a given year. All herbaceous and woody vegetation types responded to summer monsoon rainfall, while grassland/shrubland also displayed a brief spring growing season following winter snowmelt. MSAVI values of shrublands corresponded well with precipitation variability both for summer rainfall and winter snowfall, and can be potentially used as a drought indicator vegetation type on the San Carlos Apache Reservation. We demonstrated that high temporal frequency satellite based MSAVI can provide near-real time drought monitoring to inform land management decisions, especially on vegetated tribal land areas where in situ precipitation data are limited and spatially sparse.