NDVI and Accumulated Antecedent Precipitation (APP) in four different vegetation types in drylands of Mendoza, Argentina

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Arid and semi-arid ecosystems are under the pressure of climate change and are facing overgrazing and logging, which has led to increased degradation and desertification processes. The Drylands of Mendoza, Argentina, are fragile ecosystems devoted to cattle breeding on native bushes and rangelands. Livestock farming relies on the productivity of natural resources, closely related to the monthly, annual, and seasonal rainfall, which is a critical driver of vegetation productivity and dynamics. This study aims to determine the relationship between NDVI and Accumulated Antecedent Precipitation (AAP) in natural dryland as a basis for decision support in cattle grazing. NDVI from MODIS-Terra (MOD13Q1 V6.1) and AAP estimated by satellite using GPM (Global Precipitation Measurement) were correlated using Pearson's Correlation Coefficient at monthly timesteps over a period of 20 years (June 2000 to May 2020) considering 0 AAP (monthly) and 1, 3-, 6-, 9- and 12-months AAP. The analysis was carried out spatially (pixel-to-pixel) in 5 points of each of 4 primary vegetation types of the interest area (Bush steppe with low land cover; Open Bush; Forest of Prosopis Flexuosa; and Psammophilious Grassland). NDVI responses to 3 months of AAP were significant for all vegetation types in the study area. Tracking vegetation responses to rainfall in this region is of outmost importance for management of the limited water resources.