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Evapotranspiration from lowland native shrubland ecosystems in Nevada's (USA) eastern Great Basin and its relationship to remotely sensed measures of vegetation

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Development of new ground water resources in rural lands surrounding urban areas of the arid western United States has been identified as a key to maintaining the economic viability of this region. The extent and rate at which ground water can be sustainably extracted, while avoiding or minimizing environmental impacts, depends to a large degree on how much of the existing resource escapes back to the atmosphere via the process of evapotranspiration (ET). The primary objective of this study was to quantify ET from six lowland basin sites in eastern Nevada and relate ET rates measured at multiple temporal scales to variability in environmental driving forces as well as remotely sensed vegetation structure. It was found that the day-to-day variability in ET was best explained by net radiation and the amount of precipitation of the preceding day. Air temperature, the vapour pressure deficit of air, root-zone soil water content and the remotely-sensed Normalised Difference Vegetation Index (NDVI) were less successful in explaining variability on the daily time scale. On an annual time scale, differences between the six study sites were best explained ($r2 = 0.94$) by the amount of precipitation – wetter sites featuring higher ET rates. On average ET exceeded precipitation by 84 %, the difference being due to groundwater use. The NDVI explained 65 % of the variability between sites.