



## **Energy Partition From Various Climate Conditions And Land Use Types**

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Investigating how energy partitions and what factors control energy exchange is critical for better understanding the hydrological cycle, boundary layer dynamics, and land -atmosphere coupling. Climate and land use conditions are the two main factors to control energy partition. However, previous studies discussed energy partition and factors that controlled Bowen ratio (i.e. ratio of sensible heat flux to latent heat flux) in limited land use types and climate conditions. To provide a more comprehensive analysis over various climate and vegetation types, in this study, we studied eleven different land use types in the eight different climate zones within the United State. The results found out that the Mediterranean climate zone with dry summer season, dry arid (desert) climate zone, and the higher latitude area with severe winter would had higher Bowen ratio, lower precipitation and net radiation. In contrast, the humid climate zones had the lower Bowen ratio, higher net radiation and precipitation. Moreover, the higher Bowen ratio usually happened in the winter or early spring seasons.

Regarding land conditions, it is found that soil moistures are the key factor to control Bowen ratio in the drier climate areas. Hence, the grassland and closed shrublands sites have higher Bowen ratio than deciduous broadleaf forests and evergreen needle-leaf forests sites' because of shallower root systems that lack access to the full storage of water in the vadose zone. However, in the humid areas, land use factors, such as stomatal resistance and leaf area, would play an important role in changing latent heat and sensible heat. Based on the tight relationships between Bowen ratio and conditions of climate and land use, we suggest that Bowen ratio could be a useful tool for understanding the potential feedbacks of changes in climate and land use to energy partition and exchange.