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Remote Sensing of Vegetation Function and Traits

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Plants' functional traits reflect their ecological strategies, responses to environmental factors, and shape ecosystem properties. The variation in functional traits is important for addressing ecological questions across multiple scales, demanding standardized techniques across space and time. This research domain has proven highly productive for comprehending ecological and evolutionary patterns and processes related to the functional characteristics of plants. Consequently, precise and timely acquisition of plant traits improves our understanding of the impact of environmental changes and disturbances on plants. Remote sensing coupled with advanced models has the capacity to monitor vegetation functioning through traits across multiple spatial and temporal scales. Spectral signals from remote sensing instruments enable the retrieval of species traits, including pigments, species composition, ecosystem structure and function. Plant traits can be retrieved from remote sensing through radiative transfer model inversion, machine learning, and deep learning techniques. As remote sensing data become more accessible through UAVs and freely available satellite data, machine and deep learning have emerged as compelling methods for enhancing the extraction of plant traits from airborne and spaceborne sensors. This Special Issue presents innovative contributions from authors from around the world that examine the application of both active and passive remote sensing sensors in the retrieval of key vegetation and landscape metrics that reflect ecosystem structure and function.



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