

عنوان مقاله:

Narrow band based and broadband derived vegetation indices using Sentinel-2 Imagery to estimate vegetation biomass

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خلاصه مقاله:

Forest's ecosystem is one of the most important carbon sink of the terrestrial ecosystem. Remote sensing technology provides robust techniques to estimate biomass and solve challenges in forest resource assessment. The present study explored the potential of Sentinel-2 bands to estimate biomass and comparatively analyzed of red-edge band based and broadband derived vegetation indices. Broadband indices include normalized difference vegetation index, modified simple ratio and atmospherically resistant VI. Whereas, red-edge band indices include two red-edge normalized difference vegetation index and sentinel-2 red-edge position. Results showed that red-edge band derived spectral indices have performed better than the Broadband indices. The coefficient of correlation for normalized difference vegetation index, modified simple ratio and atmospherically resistant-VI was 0.51, 0.44 and 0.31 respectively, On the other hand, red-edge band indices showed higher correlation of R2 0.62, 0.64 and 0.55, respectively. Similarly, in stepwise regression red-edge normalized difference vegetation index (using band 6) was selected in final model (as overall R2 of the model was 0.60) while all other indices were removed because they have non-significant relationship with the biomass. Accuracy assessment shown the red-edge index has highest R2 (0.64) and least error of (31.29 t/ha) and therefore the study concluded that narrowband indices performed better to estimate biomass and thus final model contained only red-edge index to predict biomass over the study area. The study suggests that more in-depth research should be conducted to explore further properties of red-edge indices for vegetation parameters prediction.

کلمات کلیدی:

Red-edge (RE), Red-edge normalized difference vegetation index (RENDVI), Sentien-2, Sentinel-2 red-edge position ((S2REP

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