Remotely sensed upper canopy leaf area index and forest floor vegetation cover as indicators of NPP in a Siberian larch forest

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We demonstrated that the leaf area index (LAI) and forest floor vegetation cover (FVC) are indicators of net primary productivity (NPP) in Siberian larch forest by considering forest biometric and CO_2 budget parameters. Further, we estimated the distributions of these indicators and the corresponding NPP using Landsat ETM+ imagery. This estimation was based on the spectral measurements of larch leaves and the forest floor and on radiative transfer modeling studies. The results revealed that the estimated and observed values of larch LAI and FVC were similar, and the estimated NPP (198 - 246 gC m^2 yr^{-1}) was consistent with that obtained from observations from meteorological towers and soil heterotrophic respiration values (130 - 280 gC m^2 yr^{-1}) from 2000 to 2006 at the study site. We present the geographical distributions of larch LAI, FVC, and annual NPP that are associated with the components of the CO_2 budget and spectral parameters, which will be used to conduct intercomparison studies in the future.