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DATA PAPER

Shin Nagai · Kenlo Nishida Nasahara · Shinpei Yoshitake · Taku M. Saitoh

Seasonality of leaf litter and leaf area index data for various tree species in a cool-temperate deciduous broad-leaved forest, Japan, 2005–2014

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Abstract This paper reports seasonal data regarding leaf litter for 14 deciduous broad-leaved species and one evergreen coniferous species as well as leaf area index (LAI) data for the 14 deciduous broad-leaved species in a cool-temperate deciduous broad-leaved forest in Japan. The seasonal leaf biomass of various tree species is important for accurately evaluating ecosystem functions such as photosynthesis and evapotranspiration under climate change. However, there is a lack of freely available, long-term data. We collected litterfall every 1 to 4 weeks from September or October to November or December each year from 2005 to 2014 in Takayama, Japan (36°08′46″N, 137°25′23″E, 1420 m a.s.l.). After sorting the litter into leaves (according to species categories), stems + branches, and "other", we dried and weighed the litter groups. We also collected seasonal leaf data (number of leaves and leaf length and width) for each broad-leaved species, which we recorded every 1 to 4 weeks from April or May to October or November using multiple target shoots. To estimate the LAI in autumn for each deciduous broad-leaved species, we used a semi-empirical model of the vertical integration of leaf dry mass per unit leaf area. To estimate the LAI in spring and summer, we used the relationship between the LAI in autumn and the seasonal leaf data. Our data provide input, calibration, and validation parameters for determining LAI based on satellite remote-sensing observations or radiative transfer models and for use in ecosystem models.

Keywords Deciduous broad-leaved forest · Ground-truth · Leaf litter · Leaf area index (LAI) · Leaf mass per area · Leaf seasonality · Japan · Semi-empirical model · Species discrimination · Decadal data set

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Shin Nagai and and Kenlo Nishida Nasahara contributed equally to this work.

S. Nagai (✉)
Department of Environmental Geochemical Cycle Research, Japan Agency for Marine-Earth Science and Technology, 3173-25 Showa-machi, Kanazawa-ku, Yokohama, Kanagawa 236-0001, Japan
E-mail: nagais@jamstec.go.jp
Tel.: +81(45)778-5594

K. N. Nasahara
Faculty of Life and Environmental Sciences, University of Tsukuba, 1-1-1 Tennodai, Tsukuba, Ibaraki 305-8572, Japan

S. Yoshitake · T. M. Saitoh
River Basin Research Center, Gifu University, 1-1 Yanagido, Gifu 501-1193, Japan