

Study on phenology of terrestrial vegetation by remotesensing, flux observation, and numerical model

Kenlo Nishida[1], Atsushi Higuchi[2]

[1] Inst. Agric. For. Eng, Univ. Tsukuba, [2] HyARC, Nagoya Univ

Seasonal changes of terrestrial vegetation (phenology) such as budburst or leaf senescence are important physiological and climatological process because of significant influences on annual energy and carbon cycle with sensitive response to climate change. They can be good indicator of change of regional climate and environment. However, active investigations on these phenomena from physical and physiological standpoints in terms of carbon/energy cycle have just started recently. In fact, we have not clarified the phenological meaning of spectral vegetation index captured by remote sensing especially with comparisons to carbon and energy flux although this is important information for monitoring of past and recent change of regional climate and environment. It is also important for application of remote sensing for calibration and validation of terrestrial ecosystem models. In this study, we investigated phenology at several flux sites in eastern Asia with remote sensing data (NOAA-AVHRR, Terra-MODIS, SPOT-Vegetation), flux observation, and Biome-BGC model. As a result, various vegetation indices responded to different stages of phenology implying that detection of phenological stages in more details may be possible taking advantages of such features. Meanwhile, the function of phenology submodel of the terrestrial ecosystem model were investigated.