Relationship among phenology, ecosystem process, and biodiversity

Chair: Shin Nagai
Very simple data collection (networking of networks) in each country and region will develop phenological studies!!

Collection of

1: phenological information for discrimination of tree species
2: in situ phenological observation data
3: phenology images taken by time-lapse digital cameras
4: ground-truth for land use and land cover change
1: Collection of phenological information for discrimination of tree species

Spatial distribution of the timing of blooming of *Castanopsis sieboldii*
Seasonal RGB images observed by SENTINEL-2 at Koishikawa Botanical Garden in Tokyo (10m res.)

19 December 2017

28 April 2018

13 April 2018

26 August 2018

[https://sentinel.esa.int/web/sentinel/missions/sentinel-2]
Discrimination of tree species by analysing seasonal change of canopy surface caused by blooming and leaf-flush

Blooming of *Castanopsis sieboldii* (chinquapin)
2: Collection of in situ phenological observation data


[http://db.kahaku.go.jp/webmuseum/]

Year-to-year variability of the timing of full blooming at Institute for Nature Study, National Museum of Nature and Science in Shirokanedai, Tokyo

[http://db.kahaku.go.jp/webmuseum/]
3: Collection of phenology images taken by time-lapse digital cameras
Global phenology observation networks by using time-lapse cameras

Web Camera Images of National Parks and Wildlife in Japan

http://www.pheno-eye.org

European Phenology Camera Network
(http://european-webcam-network.net/)

Phenological Eyes Network

PhenoCam

Australian Phenocam Network

https://phenocam.sr.unh.edu/webcam/
e-phenology

←https://phenocam.org.au/
→http://www.recod.ic.unicamp.br/ephenology/client/index.html#/
8 million phenological and sky images from 29 ecosystems from the Arctic to the tropics: the Phenological Eyes Network

Data paper: Nagai et al. (in press, Ecological Research)

Get data: http://pen.jamstec.go.jp
4: Collection of ground-truth for land use and land cover change

Year-to-year variability of deforestation detected by daily Terra/Aqua MODIS satellite-observed vegetation index (500m res.)

Spatial resolution is very coarse. We cannot evaluate land cover type after deforestation.
Collection of field survey images published on “Mapillary”
[https://www.mapillary.com/]

Land uses and land cover well link plant phenology.

RGB image observed by SENTINEL-2 satellite (10m res.) on 7 June 2018
Discrimination of the type of secondary forest is very important in the southeast Asia!!

Not sufficient to collect ground-truth!!

▼ RGB image observed by SENTINEL-2 satellite (10m res.) on 9 May 2018