

Towards understanding of the spatiotemporal variability of NCP and biodiversity in the current:

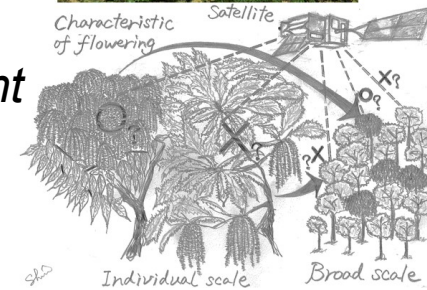
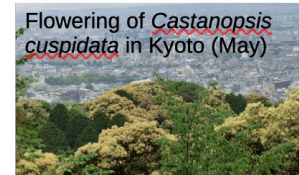
Satellite remote sensing



Monitoring general flowering in Borneo by PlanetScope constellation satellites with a 3 m spatial resolution.



Tree discrimination of evergreen broad-leaved trees by focusing on the characteristics of plant phenology.



11 May 2019 in Kyoto

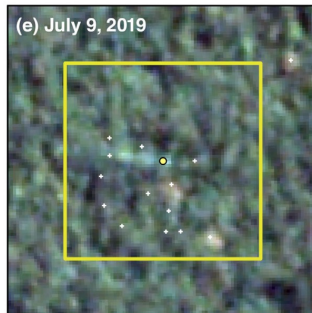
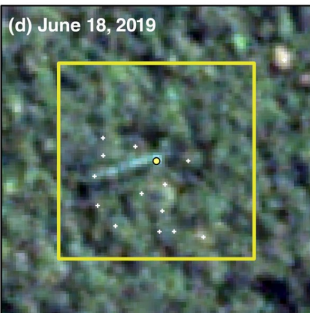
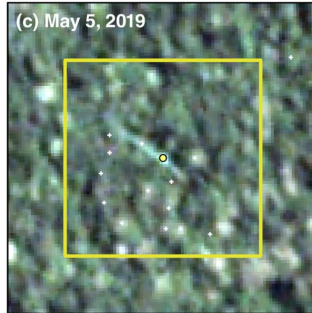
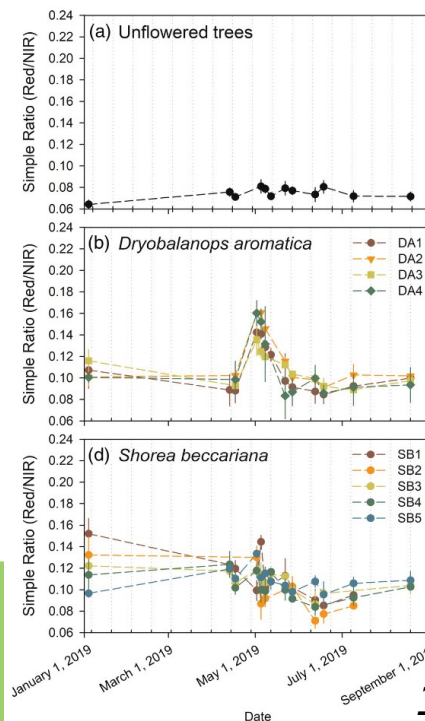
Ancient Imperial Palace



Taken on 7 May 2016

Sentinel-2 satellites with a 10 m spatial resolution.

Higashiyama



[Miura et al., 2023, Ecol. Res.]

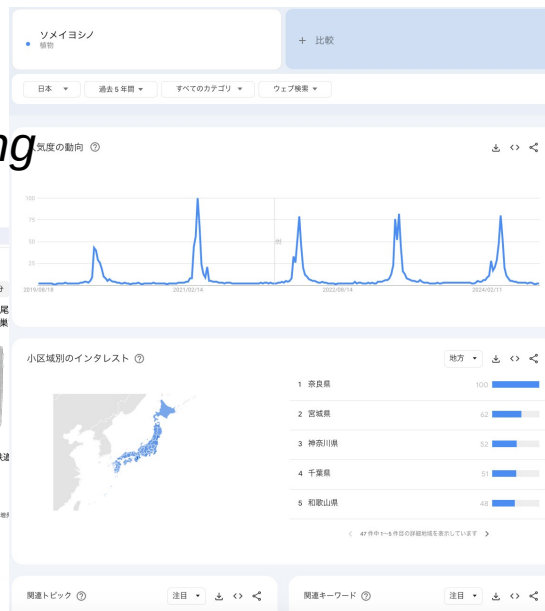
[Shin et al., 2023, Ecol. Res.]

Towards understanding of the spatiotemporal variability of NCP and biodiversity in the current:

Social sensing



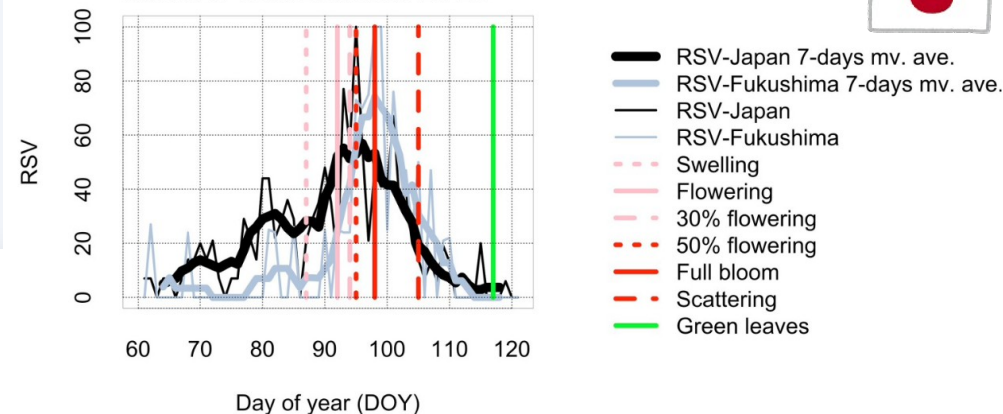
Detection of cherry flowering along Tarumi railway in Japan by using YouTube and Flickr.



Detection of people's interests in cherry flowering at Miharu-Takizakura in Japan by using Google Trends.



Miharu Takizakura: 2020



- RSV-Japan 7-days mv. ave.
- RSV-Fukushima 7-days mv. ave.
- RSV-Japan
- RSV-Fukushima
- Swelling
- Flowering
- 30% flowering
- 50% flowering
- Full bloom
- Scattering
- Green leaves

[https://www.youtube.com/results?search_query=%E6%A1%9C%E3%80%80%E6%A8%BD%E8%A6%8B%E9%89%84%E9%81%93]

[https://trends.google.com/trends/explore?date=today%205-y&geo=JP&q=%2Fm%2F02qg1nw&hl=ja]

TABLE 1 Cherry flowering phenology detected from Flickr and YouTube.

Station	Elevation (m)	Land cover and use within 500 m	Flickr	YouTube
Tarumi	166	Rice paddy, settlement, evergreen coniferous forest, deciduous broad-leaved forest, Neo River	Cy: FB 16 Apr 2011; 20%–30% flowering–FB 27 Mar 2021	Cy: FB 6 Apr, 12 Apr 2014; FB 10 Apr, 11 Apr 2015; FB 9 Apr 2016; scattering–green leaves 12 Apr 2016; FB 15 Apr 2017; FB 8 Apr, 9 Apr, 13 Apr 2019; FB 4 Apr 2020; FB 31 Mar, 1 Apr 2021; FB 2 Apr, 9 Apr 2022; 50% flowering–FB 27 Mar 2023; FB 28 Mar, 31 Mar, 2 Apr 2023; green leaves 8 Apr 2023 Cj: FB 9 Apr 2019 Csp: FB 9 Apr 2016; FB 1 Apr 2018; FB 9 Apr 2019; FB 31 Mar 2021; FB 28 Mar, 2 Apr 2023
			Cy: FB 27 Mar 2021	Cy: FB 6 Apr 2014; FB 10 Apr, 11 Apr 2015; FB 9 Apr 2016; FB 15 Apr 2017; FB 1 Apr 2018; FB 4 Apr 2020; FB 31 Mar, 1 Apr 2021; FB 2 Apr, 9 Apr 2022; FB 27 Mar, 28 Mar, 31 Mar 2023; green leaves 8 Apr 2023 Cj: FB 6 Apr 2014; FB 10 Apr 2015; FB 28 Mar, 4 Apr 2020; FB 27 Mar, 28 Mar 2023 Csp: FB 6 Apr 2014; FB–scattering 12 Apr 2014; FB 10 Apr, 11 Apr 2015; FB 9 Apr 2016; green leaves 12 Apr 2016; FB 15 Apr 2017; FB 1 Apr 2018; 50% flowering 4 Apr 2020; FB 1 Apr 2021; FB 2 Apr, 9 Apr 2022; FB 28 Mar, 31 Mar 2023; green leaves 8 Apr 2023

[Shin et al., 2024, Frontiers in Sustainable Tourism]

[Shin et al., 2022, PLOS ONE]

16th AOGEOS Symposium@Tokyo 3 Sept. 2024



Towards understanding of the spatiotemporal variability of NCP and biodiversity in the past: Text and video mining (mining of historical dark data)

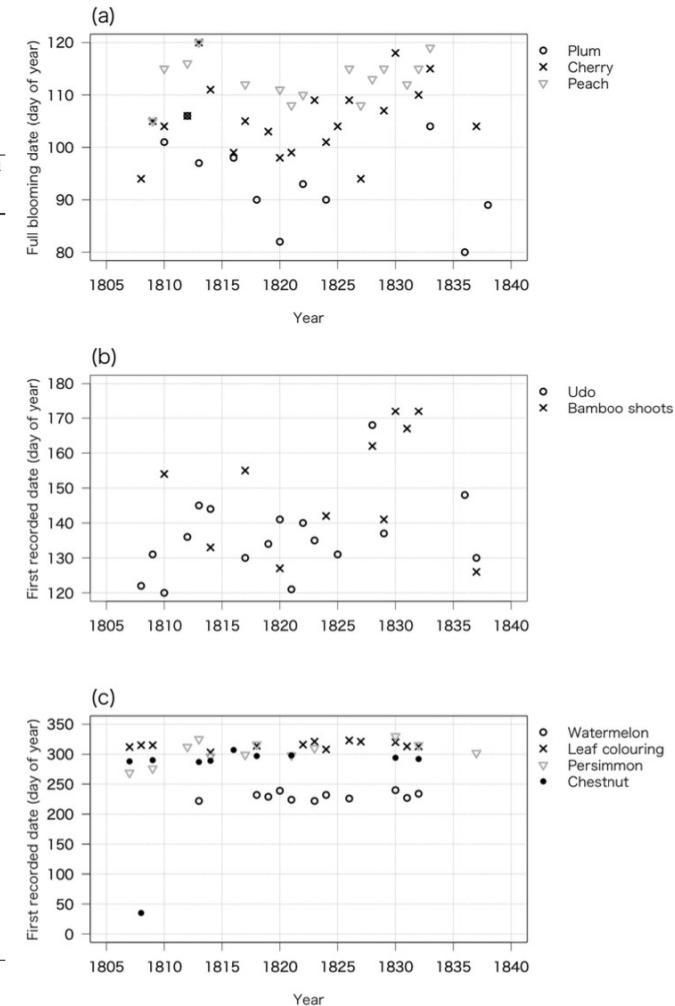


Retrieved year-to-year variability of flowering phenology and seasonal foods in Kanazawa, Japan from the Kakuson Diary during 1807-1830.



Table 3 Total numbers of records, numbers of years recorded, and average and SD of the first recorded date in each year of seasonal foods

Season	Common name	Species name	Total number of records	Number of years recorded	Average of first recorded date in each year (day of year)	SD of first recorded date in each year (days)
Spring (1 Mar – 31 May)	Udo	<i>Aralia cordata</i>	30	17	136.1	11.6
	Bamboo shoots	<i>Phyllostachys</i>	16	11	150.1	17.3
	Susu bamboo shoot	<i>Sasa kurilensis</i>	11	9	139.6	8.1
	Bracken	<i>Pteridium aquilinum</i>	11	7	134.7	4.5
	Japanese butterbur	<i>Petasites japonicus</i>	1	1	135	NA
	Japanese mustard spinach	<i>Brassica rapa</i> var. <i>perviridis</i>	1	1	148	NA
	Watermelon	<i>Citrullus lanatus</i>	15	11	229.7	6.3
Summer (1 Jun – 31 Aug)	Tubers and roots	–	15	9	188.3	42.4
	Royal fern	<i>Osmunda japonica</i>	12	8	192.8	47.4
	Aubergine	<i>Solanum melongena</i>	6	6	239.3	32.6
	Melons	<i>Cucurbitaceae</i>	6	5	210.8	49.3
	Strawberry	<i>Fragaria</i>	6	5	161.4	47.9
	Cucumber	<i>Cucumis sativus</i>	3	3	197.3	8.1
	Peach fruit	–	3	3	227	19.7
	Plum fruit	<i>Prunus salicina</i>	2	2	211	NA
	Plum fruit	–	1	1	185	NA
	Persimmon	<i>Diospyros kaki</i>	12	12	304	18.1
	Chestnut	<i>Castanea crenata</i>	20	10	267.7	82
	Sweet potato	<i>Ipomoea batatas</i>	10	8	314.8	7.1
	Mushrooms	–	15	7	278.2	14.4
	Matsutake mushroom	<i>Tricholoma matsutake</i>	7	6	285.5	7.1
	Japanese radish	<i>Raphanus sativus</i> var. <i>hortensis</i>	7	5	323.2	20
Autumn (1 Sep – 30 Nov)	Citrus fruits	–	6	4	255.4	142.4
	Japanese pear	<i>Pyrus pyrifolia</i>	6	3	273.3	4
	Malabar plum	<i>Syzygium jambos</i>	2	2	261.5	NA
	Perilla fruit	<i>Perilla frutescens</i> var. <i>crispa</i>	1	1	265	NA
	Pigweed fruit	<i>Chenopodium album</i>	1	1	265	NA
	Sugar cane	<i>Saccharum officinarum</i>	1	1	306	NA
	Japanese radish leaves	–	1	1	306	NA
	Acorn	–	1	1	318	NA
	Wasabi	<i>Eutrema japonicum</i>	1	1	24	NA
	Flowering noble orch	–	1	1	306	NA
	Flowering cherry blo	–	1	1	265	NA
	Full bloom of cherry	–	1	1	306	NA
	Full bloom of cherry	–	1	1	306	NA
	Full bloom of cherry	–	1	1	306	NA
	Full bloom of cherry	–	1	1	306	NA



[Shin et al., 2024, Int J Biometeorol.]