



Asia-Pacific networks for biodiversity observation and long-term ecological research

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Asia-Oceania region

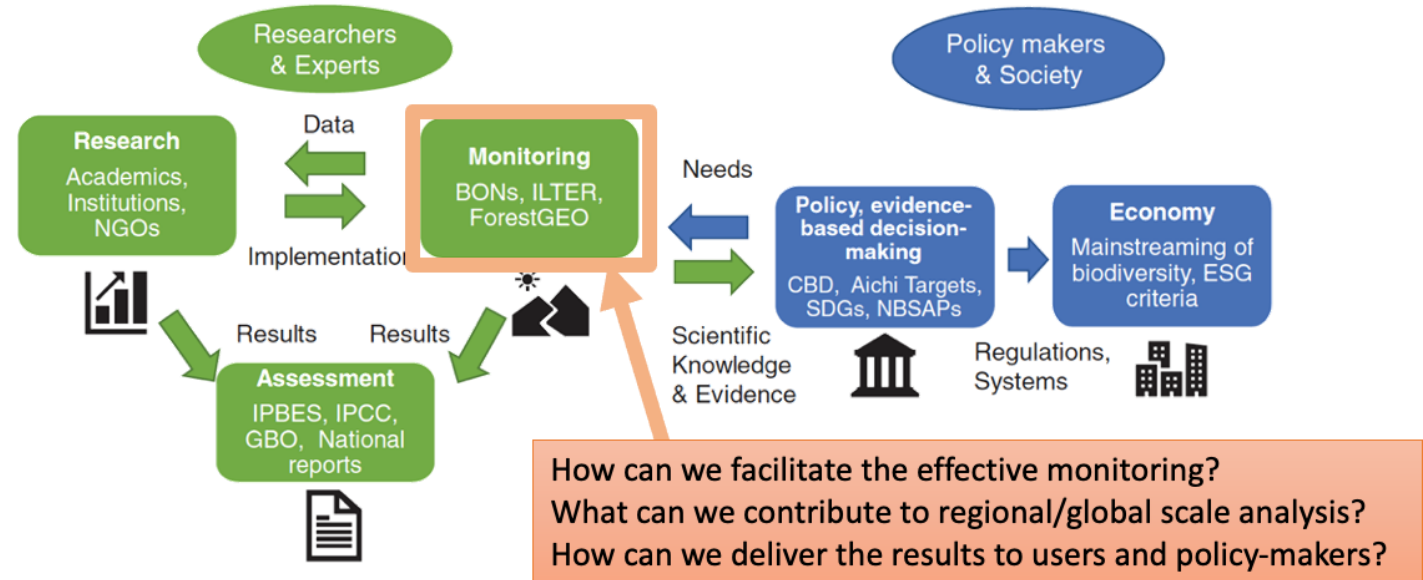
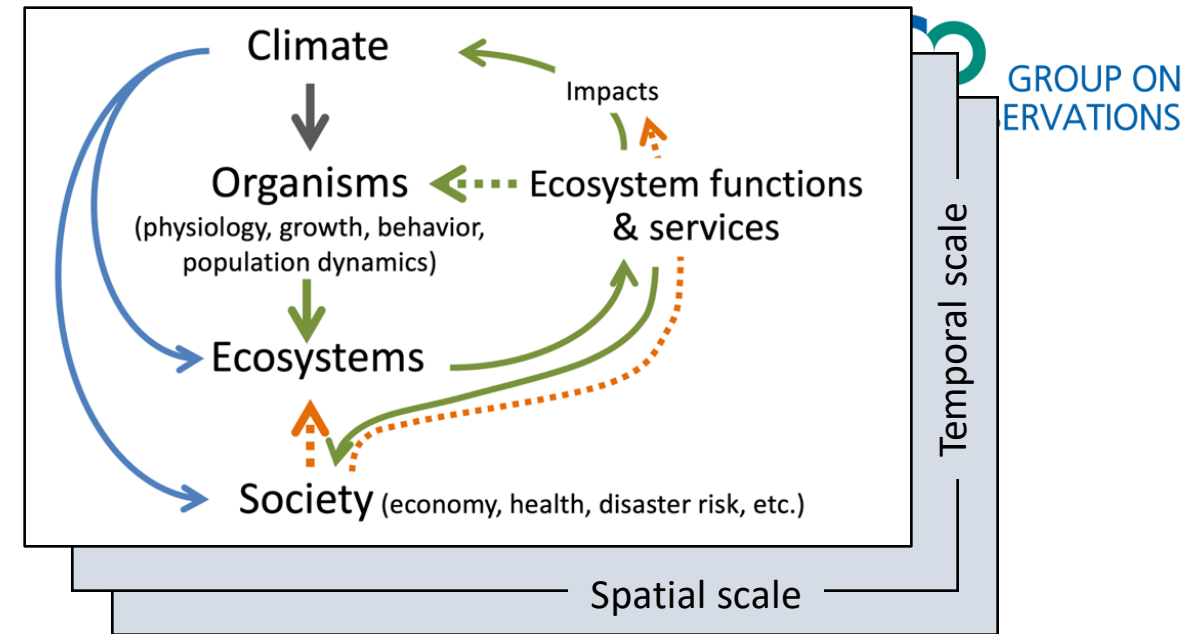
- Complex geographic characteristics
- Large population (60% of the world)
- Drastic climate change
- Natural disasters occur frequently
- Rapid, diverse socioeconomic development
- Deteriorating ecosystems

High biodiversity

- Terrestrial
- Freshwater
- Coastal and Marine
- But its loss is in progress

Diversity of ecosystems

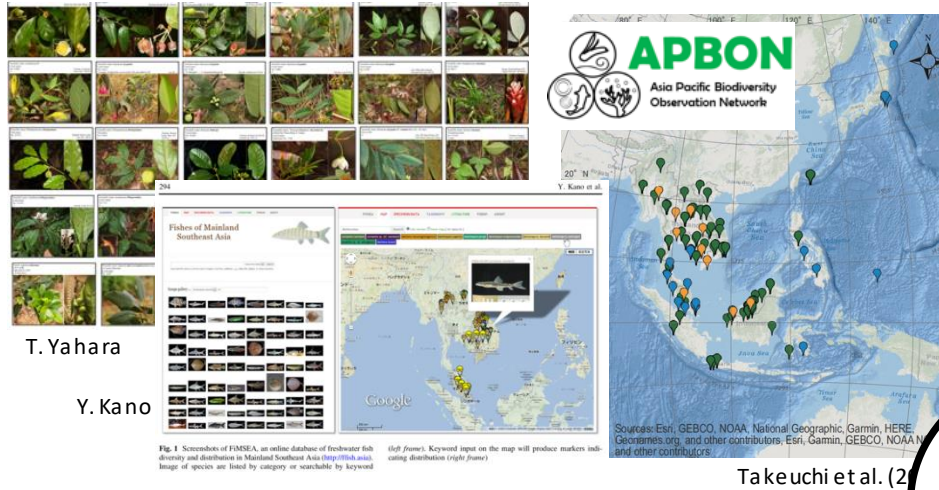
- Environmental regulation
- Provide goods and services (Nature's Contribution to People)



Takeuchi et al. (2021)

Biodiversity and ecosystem observation networks

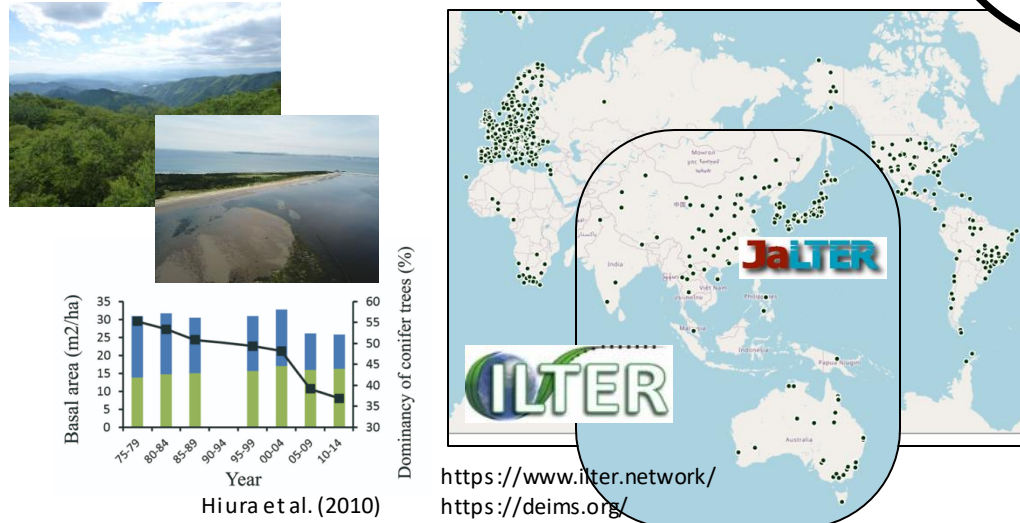
Biodiversity observation network



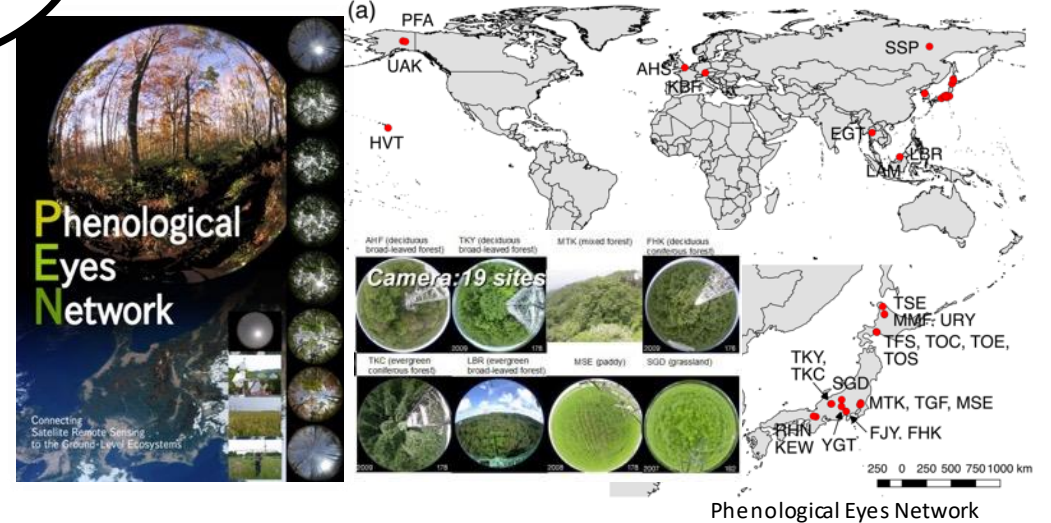
CO₂ flux and GHG research network



Long-term Ecological Research network



In-situ remote sensing observation network



Asia-Pacific Biodiversity Observation Network

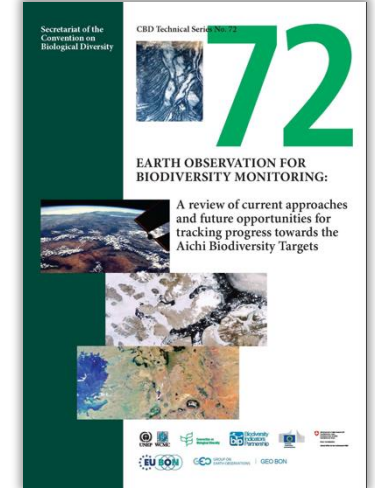
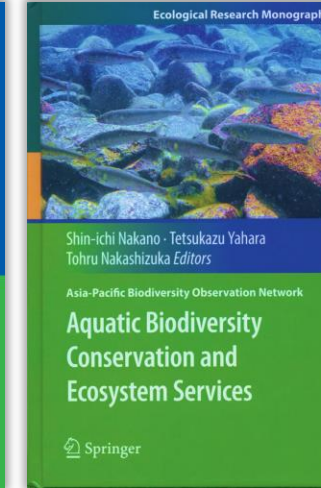
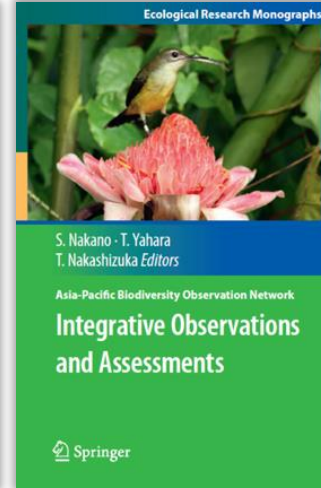
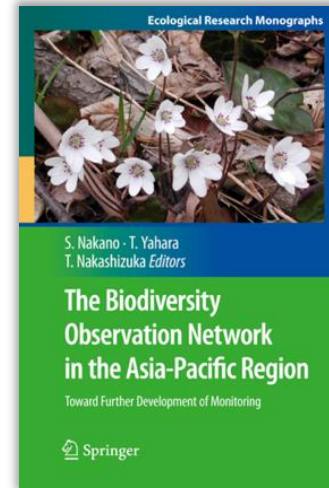
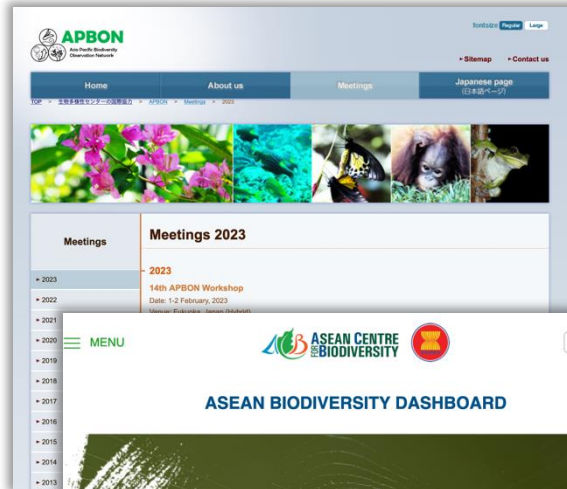
<http://www.esabii.biodic.go.jp/ap-bon/index.html>



Data and knowledge sharing as a 'package'

"APBON Books" (Springer, 2012, 2014, 2016)

APBON knowledge sharing
(Presentation files of workshops / webinars)



ASEAN Biodiversity Dashboard

<https://dashboard.aseanbiodiversity.org/>

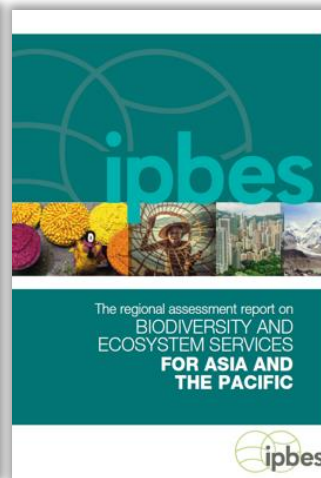
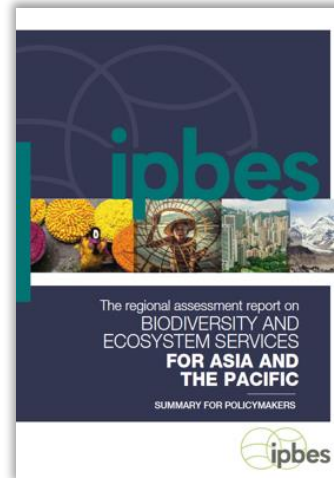


Biodiversity databases

(Biodiversity Center of Japan, MoE)

https://www.biodic.go.jp/index_e.html

IPBES Regional Assessment Report (2018)



Data paper + Database



Reports (online)



Long-Term Ecological Research Network

<https://www.ilter.network/>

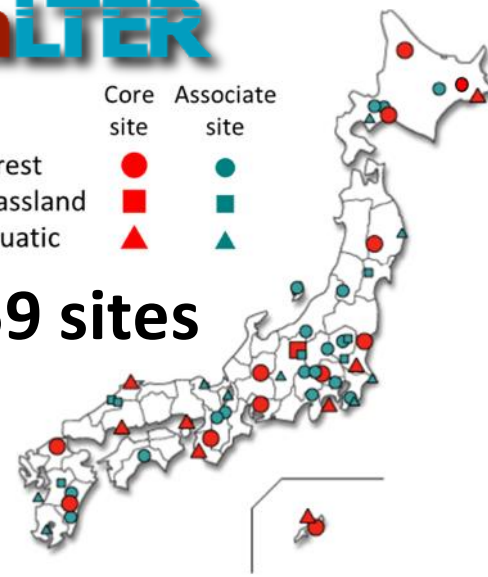


700+ sites
44 networks

JaLTER

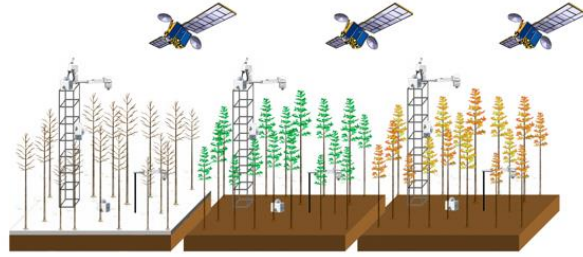
Core site Associate site
Forest ● ●
Grassland ■ ■
Aquatic ▲ ▲

59 sites



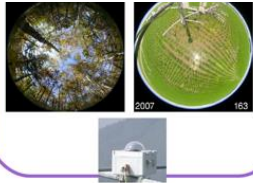
Phenological Eyes Network (PEN)

<http://www.pheno-eye.org/>

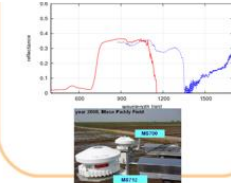


A continuous, biology-oriented, ground truth network for remote sensing

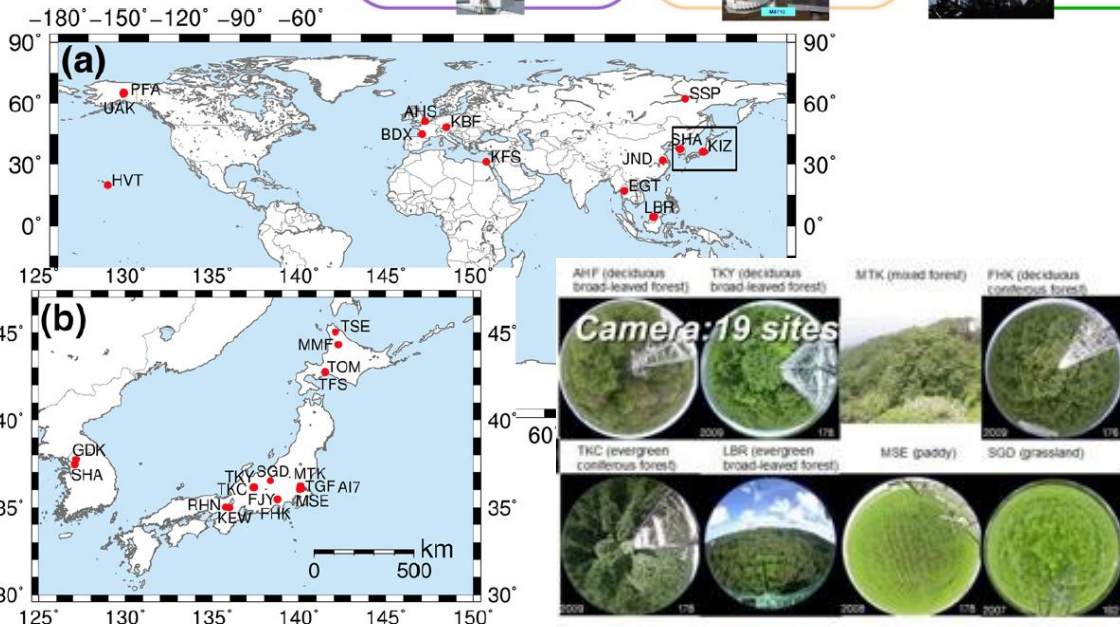
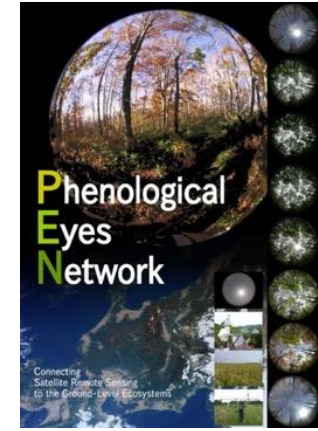
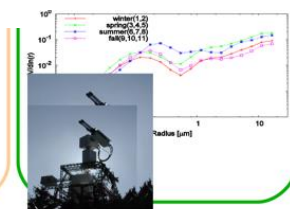
Automated
Fish-eye camera



Automatic
spectroradiometer



Sunphotometer



Database of PEN from multiple observation sites

MBN	Baganuuul, Mongolia	dry grassland	original summary log	2016-, GardenWatchCam. Managed by Chuo U.
MBU	Bayan-Unjuul, Mongolia	dry grassland	original summary log	2016-, GardenWatchCam. Managed by Chuo U.
MMF	Moshi, Japan 母子里	Mixed forest	original summary log	2010-, ADFC. Managed by Hokkaido U. and U. Tsukuba, E142.2614 N44.3219
MSE	Mase Flux Site, Japan 真瀬水田	rice paddy	original summary log	2005-, ADFC, HSSR. Managed by NIAES, U. Tsukuba, and AIST, E140.0269 N36.0539
MTK	Mt. Tsukuba, Japan 筑波山男体山頂	DBF	original summary log recent	2008-, ADFC; U. Tsukuba, E140.098 N36.225
PFA	Poker Flat Research Range, Fairbanks Alaska	ECF	original summary log recent	2011-, ADFC, HSSR. Managed by JAMSTEC and IARC. You can get spectral data here.
RHN	RIHN, Japan 総合地球環境学研究所旧庁舎	urban	original summary log	2005-2006. Sky ADFC only, E135.76683 N35.01817
SGD	Sugadaira, Japan 菅平	grassland	original summary log	2005-, ADFC. Managed by Tamagawa U., E138.34945 N36.52333
SHA	Seoul Heonilleung Alnus Forest, Korea	Deciduous forest	original summary log	2010-, ADFC.
SSP	Spasskaya Pad, Russia	DNF	original summary log	1997/08/25-2000/10/15, by Rikie Suzuki, JAMSTEC
STR	Lake Sentarum, Indonesia	DNF	original summary log	
TFS	Tomakomai Flux Site, Japan 吉小牧NIESカラマツ林	DNF	original summary log	2004. Destroyed by a typhoon. Managed by NIES. E141.51858 N42.7369
TBG	Tsukuba Botanical Garden, Japan 筑波実験植物園	etc	original summary log	2022/12/08-, ADFC. Managed by Kahaku and U. Tsukuba, E140.111 N36.102
TGF	TERC Grass Field, Japan 筑波大学草原	grassland	original summary log recent	2003-, ADFC, HSSR, SP. Managed by U. Tsukuba and AIST, E140.100 N36.1097
TKC	Takayama Coniferous Site, Japan 高山スギ林	ENF	original summary log	2007-, ADFC, HSSR. Managed by Gifu U., E137.3708 N36.1397
TKY	Takayama Flux Site, Japan 高山広葉樹林	DBF	original summary log recent	2003-, ADFC, HSSR, SP. Managed by Gifu U., U. Tsukuba, and AIST, E137.42311 N36.14617
TOC	Tomakomai Crane Site, Japan	DBF	original summary	2010- ADFC, HSSR. Managed by Gifu U., Hokkaido U. and NIES

Ecol Res (2015) 30: 211–223
DOI 10.1007/s11284-014-1239-x

SPECIAL FEATURE

Long-term and interdisciplinary research on forest ecosystem functions: Challenges at Takayama site since 1993

Kenlo Nishida Nasahara · Shin Nagai

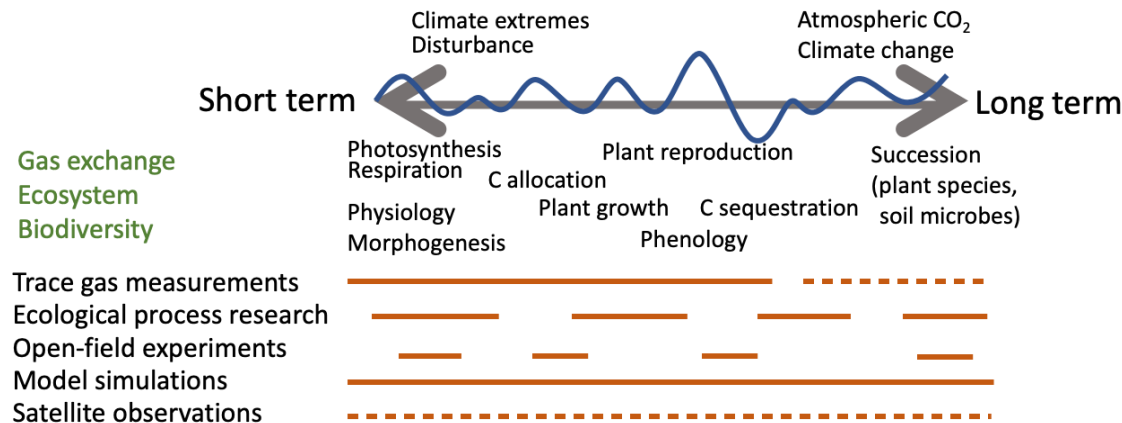
Review: Development of an in situ observation network for terrestrial ecological remote sensing: the Phenological Eyes Network (PEN)

Nasahara and Nagai (2015) Eco Res. DOI 10.1007/s11284-014-1239-x

Challenges and Opportunities

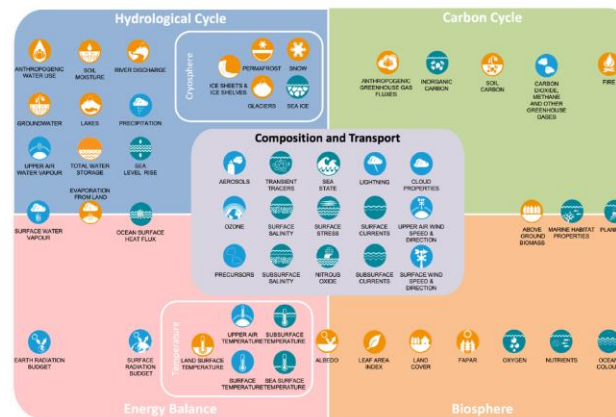
- ◆ **Multiple dimensions of “biodiversity / ecosystem data”** – genetic, species, ecosystem diversity; no. of threatened species; ecosystem functions; phenology; biomass;
 - diverse spatial/temporal resolutions of observations, diverse data format, time-lag (latency) from field observation to generating data-sets
- ◆ **Filling spatial / thematic observational gaps** by connecting *in-situ* and satellite observations, and by applying model simulations. Seek synergy between ECV and EBV.
- ◆ **Data and Knowledge generation and sharing** through national and regional cooperative capacity development, and citizen science
- ◆ **Connecting existing data/knowledge infrastructure and stakeholders** – discoverability, accessibility, interoperability ... but need to consider diversity of data and formats, cultural and linguistic barriers, equity, etc.
- ◆ **Promoting value chain: observation – analysis – intelligence – decision making (science to action)** through visualization of ecological status and changes, and connecting communities by ‘facilitators’. This value chain further supports future observations.

Dynamics of biological/ecological phenomena



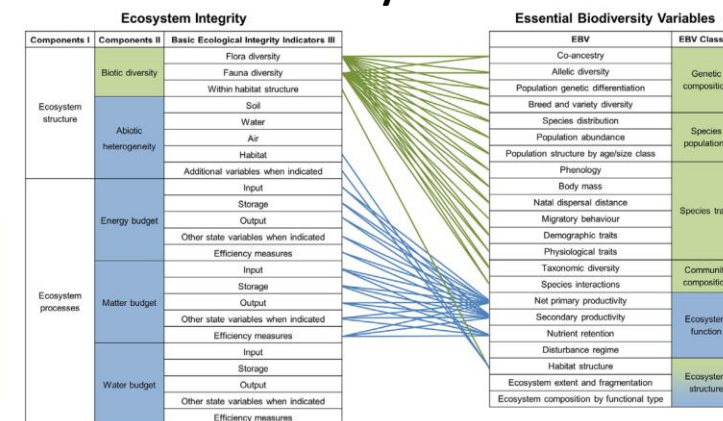
Muraoka (2022)

Essential Climate Variables



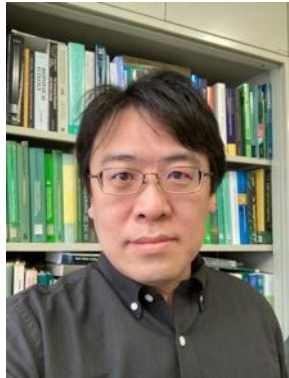
GCOS (2022)

Essential Biodiversity Variables



Haase et al. (2018)

CONTACT DETAILS



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