

# Fuji Hokuoku Flux Observation Site



Monitoring the Carbon Balance in a Larch Forest  
in the Foothills of Mt. Fuji, Japan

## Collaborators

- Forest Environment Section of Yamanashi Prefecture, Fujiyoshida City
- Fujiyoshida City and Two Other Villages Organization for the Protection of the Prefectural Estates Given by The Imperial Family
- Biodiversity Center of Japan, Ministry of Environment

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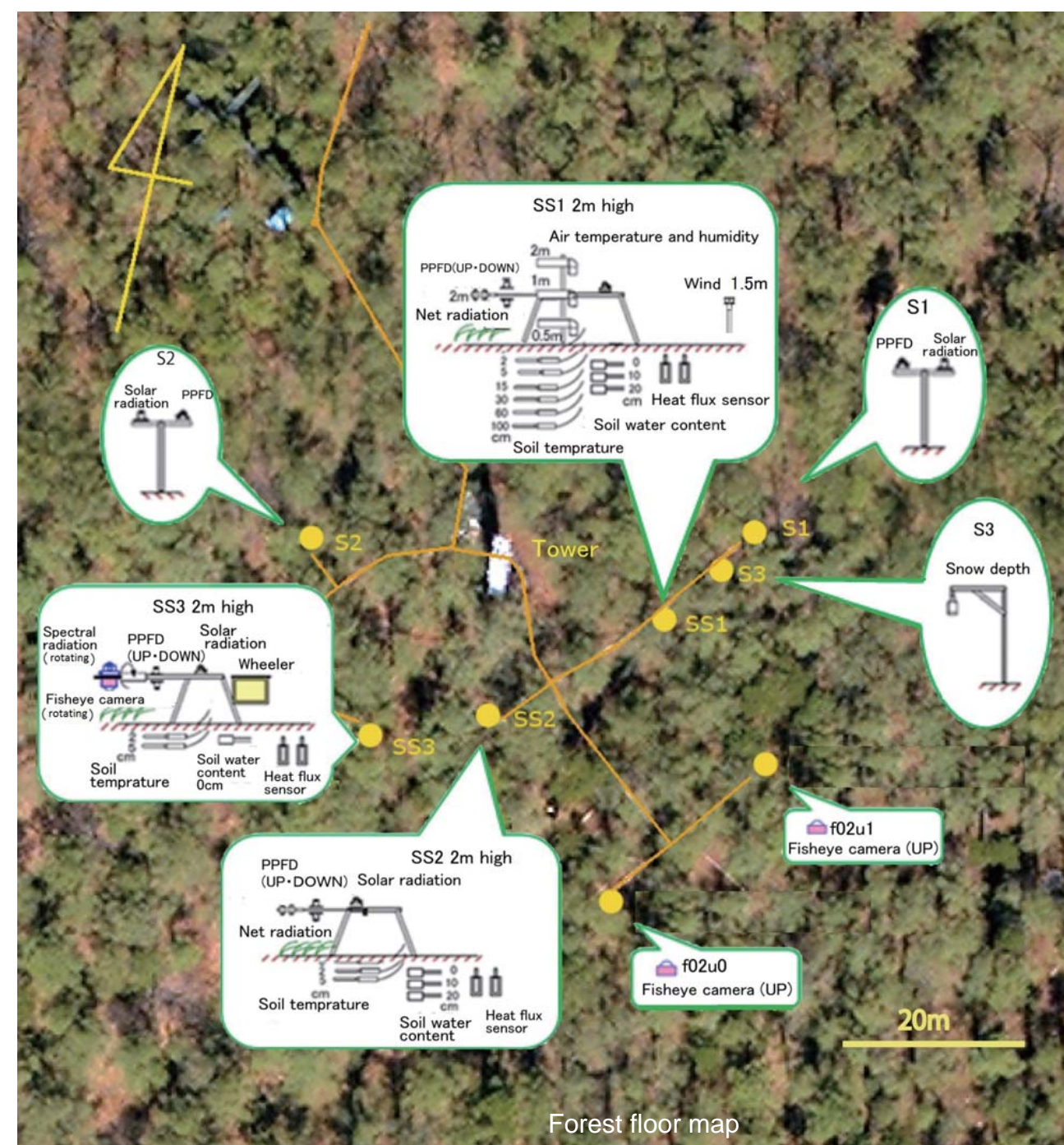


## Overview

The Center for Global Environmental Research (CGER) established the Tomakomai Flux Research Site in 1999 to carry out integrated monitoring on the carbon balance in forest ecosystems. However, the site was damaged by the strong winds accompanying a typhoon in 2004. For this reason we established the Fuji Hokuroku Flux Observation Site in the foothills of Mt. Fuji as an alternative base for monitoring, and began observations in January 2006. At this observation site, we apply various methodologies to estimate the carbon sequestration in forest ecosystems, such as the eddy covariance method, forest vegetation and soil function (photosynthesis, respiration) observations, tree growth and litter amount measurements, and remote sensing method. Recently, we also began measurements of methane and BVOC gases - which may directly or indirectly affect global warming - adopting a new measurement system. This integrated monitoring should be beneficial for further assessment and understanding of the exchanges of gas, heat, water and small particles between the land and atmosphere.

## Objective

Our objective is to conduct integrated monitoring research on forest ecosystems such as carbon cycle as a part of global environment monitoring.



## Observation Site

Location	Aza Kawahara, Kamiyoshida, Fujiyoshida City, Yamanashi Pref. Latitude and Longitude: 35° 26' N, 138° 45' E Elevation: 1050-1150 m
Land	Gradient: 3-4 degrees Soil type: Coarse-grain volcanic ash
Vegetation	Dominant species: Planted larches Tree age: about 50-55 years old Tree height: 20-25 m Area: 150 ha Spontaneous vegetation: Fujizakura ( <i>Prunus incisa</i> ) Forest floor: Broad leaved plants
Mean annual air temperature	8.8 degrees (average of 2006-2010)
Annual precipitation	1716 mm (average of 2006-2010)



## Observation Facilities

Monitoring tower	Height: 32 m (aluminum) Elastic type pole is installed on the top
Micrometeorology instruments (8 sets)	Instruments are located on the forest floor to monitor micrometeorological phenomena and soil
Photosynthesis, Respiration monitoring system	Chamber systems are installed to monitor CO <sub>2</sub> balance of larch tree and soil
Monitoring office	Portable cabin (10 m <sup>2</sup> ) for data control systems

System	Item	Number	Height(m)
Eddy covariance method	Three-dimensional sonic anemometer-thermometer	1	35
	Open-path systems (CO <sub>2</sub> and H <sub>2</sub> O flux)	1	35
	Closed-path systems (CO <sub>2</sub> and H <sub>2</sub> O flux)	1	35
	Enclosed-path systems (CO <sub>2</sub> flux, latent heat flux)	1	35
Concentration	CO <sub>2</sub> profile	10	35, 32, 27, 22, 16, 10, 4.5, 2, 1, 0.5
Soil respiration	Continuous (automated chambers)	24	Forest floor
Phenology	Fisheye lens camera	6	32, 22, 2 (2), 2 (rotate)
	Digital Camera	4	26 (N), 24 (E, N), 23 (W)
Meteorology	Global solar radiation (incoming)	6	32, 2 (5)
	Global solar radiation (outgoing)	3	30, 2 (2)
	Net radiation	3	32, 2 (2)
	PPFD (incoming)	6	32, 2 (5)
	PPFD (outgoing)	4	30, 2 (3)
	Direct/diffuse spectral radiation	1	32
	Spectral radiation (incoming)	2	32, 2 (rotate)
	Spectral radiation (outgoing)	2	30, 2 (rotate)
	Spectral direct solar radiation	1	32
	Air temperature and humidity	10	35, 32, 27, 22, 16, 10, 4.5, 2, 1, 0.5
	Two-dimensional wind	7	32, 27, 22,