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## Contact Address

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## 1. General Information

Site name (three letter code)	Narita Flux Research Site (NRT)
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Researcher #3 (e-mail)	[Soil respiration] Akinobu Okada (waseda@ccc.ddd.ac.jp)
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Researcher #4 (e-mail)	[Ecological survey] Katsuya Nomura (tsukimiso@env.ccc.ac.jp)
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Other Researchers (e-mail)	[Flux and micrometeorology] Akinobu Mayumi (crown@env.ccc.ac.jp) [Soil respiration] Kozo Kawato (harudanji@bbb.ccc.ac.jp) [Soil respiration] Randy William Bass (suketto@ddd.eee.ac.jp) [General] Masayuki Takehu (narashino@env.ccc.ac.jp)
Observation period	September 2000 to September 2004
Measurement frequency	Continuous
Infrastructure	Tower, Electrical power(AC), Facilities for communication(none), Accommodation (none)
Research fund #1	Grant-in-Aid for Scientific Research (Nos.12345878, 87654321 and 77777777) from the Japanese Ministry of Education, Culture, Sports, Science and Technology, Japan (FY2001-2009)
Research fund #2	
Research fund #3	

URL	URL : <a href="http://www.narita.co.jp">http://www.narita.co.jp</a>
Other information	

## 2. Site description

Site name (three letter code)	Narita Flux Research Site (NRT)
Country	Japan
Location	Narita, Chiba
Latitude and Longitude (first decimal of second precision), Elevation (geographic coordinates, surveying method)	44°44'4.4"N, 111°11'1.1"E (140 m above sea level) ((World Geodetic System 1984, GPS: Garmin GPSMAP60CS and map)
Slope	1-2deg
Terrain Type	Flat
Area	117ha
Fetch	300-800m
Climate (Köppen Climate Classification)	Cool temperate (Snow – fully humid – warm summer (Dfb))
Mean annual air temperature	6.2 degC (2001-2003)
Mean annual precipitation	1043 mm (2001-2003)
Vegetation Type	Japanese larch forest
Dominant Species (Overstory)	Japanese larch ( <i>Larix Kaempferi Sarg.</i> ), Birch ( <i>Betula ermanii</i> and <i>Betula platyphylla</i> ), Japanese elm ( <i>Ulmus japonica</i> ), Spruce ( <i>Picea jezoensis</i> )
Dominant Species (Understory)	Fern ( <i>Dryopteris crassirhizoma</i> , <i>Dryopteris austriaca</i> ) <i>Pachysandra terminalis</i>
Canopy height	About 15m
Age	About 100 years old
LAI	9.2 m <sup>2</sup> m <sup>-2</sup> (max) (Overstory: 5.6 m <sup>2</sup> m <sup>-2</sup> , Understory: 3.6 m <sup>2</sup> m <sup>-2</sup> )
Soil type	Volcanogenous regosol

## 3. Measurement Item

### 3-1. Meteorology

Observation items	Levels / Depth	Instrument
Global solar radiation (incoming)	41, 18, 14, 5, 1.5 (six points) m 40, 18, 1.5 m	Pyranometer (MS-601, Eko, Japan) Radiometer (MR40, Eko, Japan)
Global solar radiation (outgoing)	40, 18, 1.5 m	Radiometer (MR40, Eko, Japan)
Long-wave radiation (incoming)	40, 18, 1.5 m	Radiometer (MR40, Eko, Japan)

Long-wave radiation (outgoing)	40, 18, 1.5 m	Radiometer (MR40, Eko, Japan)
Net radiation	40, 18, 1.5 m	Radiometer (MR40, Eko, Japan)
PPFD (incoming)	40, 18, 5, 1.5 (three points) m	Quantum sensor (LI-190S, LI-COR)
PPFD (outgoing)	40 m	Quantum sensor (LI-190S, LI-COR)
Direct/diffuse radiation	40 m	Pyranometer (MS-601, Eko, Japan), Rotating shadow blade (PRB-100, PREDE, Japan)
Direct/diffuse PPFD	40 m	Quantum sensor (LI-190S, LI-COR), shadow band (PSB-100, PREDE, Japan)
Air temperature	40, 27, 22, 18, 14, 8, 5, 1.5 m	Platinum resistance thermometer and capacitive hygrometer (HMP45D, Vaisala)
Humidity	40, 27, 22, 18, 14, 8, 5, 1.5 m	Platinum resistance thermometer and capacitive hygrometer (HMP45D, Vaisala)
Soil temperature	0, 0.05, 0.1, 0.2, 0.5 m (three points)	Platinum resistance thermometer
Soil heat flux	0.05 m (five points)	Heat flux plate (MF-81, Eko, Japan)
Soil water content	0.05 (three points), 0.1 (two points) m	TDR sensor (CS615, Campbell)
Wind speed	40, 27, 23, 18, 14, 8.0, 5.0, 1.5 m	Sonic anemometer (MA-130A, Eko, Japan)
Wind direction	40, 27, 23, 18, 14, 8.0, 5.0, 1.5 m	Sonic anemometer (MA-130A, Eko, Japan)
Barometric pressure	40, 18, 8, 5 m	Barometer (PTB100, Vaisala)
Precipitation	41, 1.5 (three points) m	Tipping-bucket rainguage with heater (52 202, R. M. Young)
CO <sub>2</sub> concentration	41, 38, 32, 26, 22, 16, 12, 6, 3, 1 m	Closed-path CO <sub>2</sub> /H <sub>2</sub> O analyzer (LI-6262, LI-COR)

### 3-2. Eddy correlation method

System	Open- and closed-path system (CO <sub>2</sub> flux, latent heat flux)
Wind speed	Three-dimensional sonic anemometer-thermometer (DA600-3TV (Probe TR-61C), KAIJO)
Air temperature	Three-dimensional sonic anemometer-thermometer (DA600-3TV (Probe TR-61C), KAIJO)
Water vapor	Open- and Closed-path CO <sub>2</sub> /H <sub>2</sub> O analyzers (LI-7500 and LI-6262, LI-COR)
CO <sub>2</sub>	Open- and Closed-path CO <sub>2</sub> /H <sub>2</sub> O analyzers (LI-7500 and LI-6262, LI-COR)
Measurement height	27 and 42 m
Sampling frequency	10 Hz
Averaging time	30 min
Data logger	DRM3a, TEAC, Japan
Data storage	MO

Original data (Raw data or statistics)	Raw data

### 3-3. Other

Soil respiration	Continuous (automated chambers)
Photosynthesis	Occasionally
Ecological Investigation	Tree heights, stand density, diameter, biomass, LAI (1999, 2001, 2003)

### 4. Note (e. g. calibration information, Publications)

<p><b>Calibration information</b>  Open-path analyzers were calibrated approximately every two months with standard CO<sub>2</sub> gases and a dew point generator (LI610, LI-COR).</p> <p>The gain of CO<sub>2</sub> of the closed-path analyzers was checked once a day by flowing two standard CO<sub>2</sub> gases of 320 ppmv and 420 ppmv that were automatically controlled using a CR23X (LI-COR).</p> <p><b>Publications</b>  Yoshida, Y., Hoshino, S., Okada, A and Nomura, K. 2015. CO<sub>2</sub> and water vapor exchange of Narita flux research site. Agric. For. Meteor., 99999: 9999–999999.</p>
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