10 Supplemental Materials

Table S1. Sensors on the Oregon ForEST Micro-Meteorological stations

Climate Variable	Sensor Brand	Model Number
Air Temp/RH	Climatronics	102798-G0-H1
Solar Radiation	Li-Cor, Inc	Li-200SL
Wind Speed/Dir	Met-One	034B
Snow Depth	Campbell Scientific	SR-50A
Soil Temp/Moisture	Decagon Devices	5TM
Datalogger	Campbell Scientific	CR1000x

Table S2. Algorithms for Estimating Clear Sky and Cloud Corrected Emissivity

Source	Algorithm
	Clear sky emissivity
Prata (1996)	$\varepsilon_{\text{clear}} = 1 - (1 + w)exp^{(-(1.2+3_w)^{0.5})}$
	$w = 4650\ \frac{e_o}{T_o}$
Dilley and O'Brien (1998)	$\varepsilon_{clear} = (5.31 * 10^{-13}\ \frac{T_{air}^2}{\sigma})$
	Cloud cover correction
Unsworth and Montieth (1975)	$\varepsilon_{adj} = (1 - 0.84 * c)$
Kimball et al. (1982)	$L_{\downarrow} = L_{clear} + \tau_8 * c * f_8 * \sigma * T_c^4$
	$\tau_8 = 1 - \varepsilon_{z_8}(1.4 - 0.4 * \varepsilon_{z_8})$
	$\varepsilon_{z_8} = 0.24 + 2.98 * 10^{-6} * \varepsilon_o^2 * exp^{\frac{3000}{T_o}}$
	$f_8 = -0.6732 + 0.624 * 10^{-2}\ T_c - 0.914 * 10^{-5}\ T_c^2$
Crawford and Duchon (1999)	$\varepsilon_{adj} = (1 - S) + S\ \varepsilon_{clear}$ $\varepsilon_{\text{adj}} = (1\text{-s}) + \text{s}\ \varepsilon_{\text{clear}}$

Table S3. Estimated RMSE from six longwave algorithms at two sites

Site	Method	RMSE (W m^{-2})
Forest	Kimball-Dilley	26.8
	Kimball-Prata	50.1
	Unsworth-Dilley	15.8
	Unsworth-Prata	9.1
	Crawford-Dilley	9.3
	Crawford-Prata	8.5
Open	Kimball-Dilley	31.7
	Kimball-Prata	77.6
	Unsworth-Dilley	31.1
	Unsworth-Prata	24.5
	Crawford-Dilley	22.6
	Crawford-Prata	26.1