

**Table S1.** The turnover rates (in years) of vegetation and soil pools in the QUINCY model.

Pool	Turnover rate (year)
Leaf	0.5
Fine roots	0.7
Coarse roots	8.0
Sapwood	40.0
Fruits	1.0
Litter: soluble	0.08
Litter: structural	0.1
Soil: fast pool	2.0
Soil: slow pool	100.0

**Table S2.** Soil organic matter carbon (C) and nitrogen (N) at different soil depths, down to 50 cm. Observations (in bold) and simulated carbon and nitrogen pools. The simulated values are 30 year averages.

Storage	C (gCm <sup>-2</sup> )	N (gNm <sup>-2</sup> )	C:N	obs depth (cm)
L1	<b>3078</b> 3407	<b>205</b> 379	<b>15</b> 8.9	0-10
L2	- 2913	- 330	- 9.4	-
L3	<b>2049</b> 2428	<b>169</b> 275	<b>12</b> 8.8	10-20
L4	<b>983</b> 2142	<b>113</b> 242	<b>8.7</b> 8.9	20-30
L5	<b>571</b> 2214	<b>87</b> 247	<b>6.6</b> 9.0	30-40
L6	<b>304</b> 1602	<b>63</b> 178	<b>4.8</b> 9.0	40-50

**Table S3.** The initial  $\delta^{15}\text{N}$  of the simulations and observations. The  $\delta^{15}\text{N}$  of the observed wood pool was derived from observations of bark and new wood, as no measurements of old wood before labelling were available.

Pool	Observed $\delta^{15}\text{N}$	Simulated $\delta^{15}\text{N}$
Leaf	-2.1	-2.3
Fine roots	-1.6	-2.0
Coarse roots	-2.4	-1.4
Wood	-1.2	-1.1
Litter	0.4	-1.7
SOM 0-10 cm	2.9	-1.4
SOM 10-50 cm	4.9	-0.4