**Table 1. Carbon cycle variables included in this analysis, their sample sizes, and summary of biome differences and age trends.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | n records | | |  |  |
| Variable | Description | records | plots | geographic areas | biome differences\* | age trend\*\* |
| **Annual Fluxes** | |  |  |  |  |  |
| *NEP* | net ecosystem production or net ecosystem exchange (+ indicates C sink) | 329 | 146 | 88 | n.s. | +; xB |
| *GPP* | gross primary production (*NPP* + *Rauto* or *Reco*-*NEE*) | 303 | 115 | 84 | TrB > TeB ≥TeN ≥BoN | +; xB |
| *NPP* | net primary production (*ANPP* + *BNPP*) | 214 | 112 | 74 | TrB > TeB ≥TeN > BoN | n.s. |
| *ANPP* | aboveground *NPP* | 343 | 236 | 131 | TrB > TeB ≥TeN > BoN | +; xB |
| *ANPPwoody* | woody production (*ANPPstem* + *ANPPbranch*) | 64 | 53 | 37 | n.s. | + |
| *ANPPstem* | woody stem production | 217 | 190 | 117 | TrB > TeN ≥TeB ≥BoN | n.s. |
| *ANPPbranch* | branch turnover | 69 | 59 | 42 | TrB > TeB ≥TeN | n.s. |
| *ANPPfoliage* | foliage production, typically estimated as annual leaf litterfall | 162 | 132 | 88 | TrB > TeB ≥TeN > BoN | + |
| *ANPPlitterfall* | litterfall, including leaves, reproductive structures, twigs, and sometimes branches | 82 | 70 | 55 | n.s. | + |
| *ANPPrepro* | production of reproductive structures (flowers, fruits, seeds) | 51 | 44 | 34 | n.t. | n.t. |
| *ANPPfolivory* | foliar biomass consumed by folivores | 20 | 12 | 11 | n.t. | n.t. |
| *Mwoody* | woody mortality--i.e., *Bag* of trees that die | 18 | 18 | 18 | n.t. | n.t. |
| *BNPP* | belowground NPP (*BNPPcoarse*+ *BNPPfine*) | 148 | 116 | 79 | TrB > TeN ≥TeB ≥BoN | + |
| *BNPPcoarse* | coarse root production | 77 | 56 | 36 | TeN ≥TrB | n.s. |
| *BNPPfine* | fine root production | 123 | 99 | 66 | n.s. | + |
| *Reco* | ecosystem respiration (Rauto+ Rhet) | 213 | 98 | 70 | TrB > TeB ≥TeN | + |
| *Rauto* | autotrophic respiration (*Rauto-ag*+ *Rroot*) | 24 | 23 | 15 | n.t. | n.t. |
| *Rauto-ag* | aboveground autotrophic respiration (i.e., leaves and stems) | 2 | 2 | 1 | n.t. | n.t. |
| *Rroot* | root respiration | 181 | 139 | 95 | TrB ≥TeB | + |
| *Rsoil* | soil respiration (*Rhet-soil*+ *Rroot*) | 627 | 411 | 229 | TrB > TeB > TeN ≥BoN | n.s. |
| *Rhet-soil* | soil heterotrophic respiration | 197 | 156 | 100 | TrB > TeB ≥TeN | n.s. |
| *Rhet-ag* | aboveground heterotrophic respiration | 0 | 0 | 0 | - | - |
| *Rhet* | heterotrophic respiration (*Rhet-ag*+*Rhet-soil*) | 0 | 0 | 0 | - | - |
| **Stocks** |  |  |  |  |  |  |
| *Btot* | total live biomass (*Bag* + *Broot*) | 188 | 157 | 87 | TrB ≥TeB > BoN | +; xB |
| *Bag* | aboveground live biomass (*Bag*-*wood* + *Bfoliage*) | 4466 | 4072 | 621 | TrB ≥TeN ≥TeB > BoN | +; xB |
| *Bag-wood* | woody component of aboveground biomass | 115 | 102 | 64 | TeN > TrB ≥BoN | +; xB |
| *Bfoliage* | foliage biomass | 134 | 115 | 72 | TeN > TrB ≥BoN ≥TeB | +; xB |
| *Broot* | total root biomass (*Broot-coarse+Broot-fine*) | 2329 | 2298 | 360 | n.s. | +; xB |
| *Broot-coarse* | coarse root biomass | 134 | 120 | 73 | TeN > TeB ≥BoN | +; xB |
| *Broot-fine* | fine root biomass | 226 | 180 | 109 | n.s. | +; xB |
| *DWtot* | deadwood (*DWstanding+DWdown*) | 79 | 73 | 42 | n.t. | +; xB |
| *DWstanding* | standing dead wood | 36 | 35 | 22 | n.t. | n.t. |
| *DWdown* | fallen dead wood, including coarse and sometimes fine woody debris | 278 | 265 | 37 | n.t. | +; xB |
| OL | organic layer / litter/ forest floor | 474 | 413 | 115 | n.s. | +; xB |

\* Tr: Tropical, TeB: Temperate Broadleaf, TeN: Temperate Needleleaf, B: Boreal, n.s.: no significant differences, n.t.: not tested

\*\* + or -: significant positive or negative trend, xB: significant age x biome interaction, n.s.: no significant age trend, n.t.: not tested