**Supplementary information**

**Table S1.** Summary of multiple measures of biodiversity indices. The following indices were found to be used for biodiversity-C stocks or productivity relationships in different research papers

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| --- | --- | --- |
| Index | Formula | Description |
| Tree species diversity index | , where *Pi* is the proportion of basal area for the *i*th species and *s* is the number of species. | Shannon-Wiener index for species (Magurran 2004) |
| Tree size diversity index | , where *Pj* is the proportion of basal area for the *j*th diameter class and *d* is the number of diameter class. | Shannon-Wiener index for tree size (Buongiorno *et al.* 1994) |
| Tree height diversity index | , where *Pk* is the proportion of basal area for the *k*th height class and *h* is the number of height class. | Shannon-Wiener index for tree height class (Staudhammer & LeMay 2001) |
| Integrated diversity index of  tree species and size | , where *Pij* is the proportion of basal area in the *j*th diameter class of the *i*th species, *s* is the number of tree species, and *d* is the number of the diameter class. | Integrated Shannon-Wiener index for species and tree size (Buongiorno  *et al.* 1994) |
| Species profile index | , where *Pik* is the proportion of basal area of the *k*th height class of the *i*th species, *s* is the number of tree species, height class 1 is 100 to 80 % of maximal tree height (*hmax*), height class 2 is 80 to 50 % of *hmax*, and height class 3 is 50 to 0% of *hmax*. | Integrated Shannon-Wiener index for the proportion of species in different stand layer (Pretzsch 1997) |
| Mean structural diversity index | *Hsdh = (Hs + Hd + Hh)/3*, where *Hs*, *Hd* and *Hh* is Shannon species, size and height diversity, respectively. | Mean value of tree species, size, and height indices (Staudhammer & Lemay 2001) |
| Functional dominance index | , where *CWMx is the CWM for* a *x* trait, *s* is the number of species in the community, *Pi* is the relative cover of *i*thspecies in the community and *ti* is the trait value for the *i*thspecies. | Averaged trait value in the community weighted by the species abundance or Community weighted mean of a forest plot (Garnier *et al.* 2004) |
| Functional divergence index | And  where *xi* is the trait value for the *i*th species, and , where *ai* is the relative cover of the *i*th species in the community | Variance in trait values weighted by the abundance of each species in the community (Mason *et al.* 2003) |
| Tree species diversity index (Simpson) | , where *Pi* is the proportional importance of *i*th species | Simpson diversity index for species (Magurran 1988) |