Supporting Information

Table S1. Proportions of tree basal area in each study plot from species associated with AM fungi, ECM fungi, and ericoid mycorrhizal (ERM) fungi.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Site | Plot Number | Proportion AM basal area | Proportion ECM basal area | Proportion ERM basal area |
| BART | 32 | 0.46550818 | 0.53449182 | 0 |
| BART | 33 | 0.54740373 | 0.45259627 | 0 |
| BART | 34 | 0.32112415 | 0.67887585 | 0 |
| BART | 36 | 0.26891211 | 0.73108789 | 0 |
| BART | 40 | 0.82277588 | 0.17722412 | 0 |
| BART | 42 | 0.48449001 | 0.51550999 | 0 |
| BART | 71 | 0.40867927 | 0.59132073 | 0 |
| DELA | 1 | 0.93239645 | 0.06713732 | 0 |
| DELA | 2 | 0.54484444 | 0.45515556 | 0 |
| DELA | 4 | 0.66027181 | 0.33972819 | 0 |
| DELA | 14 | 0.15904082 | 0.84095918 | 0 |
| DELA | 37 | 0.34375437 | 0.65624563 | 0 |
| DELA | 38 | 0.72826961 | 0.27173039 | 0 |
| DELA | 41 | 1 | 0 | 0 |
| HARV | 1 | 0.07042541 | 0.92957459 | 0 |
| HARV | 4 | 0.66070745 | 0.3388294 | 0.00046315 |
| HARV | 10 | 0.06708706 | 0.93291294 | 0 |
| HARV | 16 | 0.50744061 | 0.48710657 | 0.00545281 |
| HARV | 21 | 0.359281 | 0.64016435 | 0.00055465 |
| HARV | 33 | 0.24117398 | 0.75882602 | 0 |
| HARV | 37 | 0.14561608 | 0.85438392 | 0 |
| LENO | 2 | 0.19986999 | 0.80013001 | 0 |
| LENO | 3 | 0.03369556 | 0.96630444 | 0 |
| LENO | 5 | 0.98372682 | 0.01627318 | 0 |
| LENO | 6 | 0.03273843 | 0.96726157 | 0 |
| LENO | 62 | 0.38208535 | 0.61791465 | 0 |
| LENO | 63 | 0.91260772 | 0.08739228 | 0 |
| LENO | 64 | 0.59565253 | 0.40434747 | 0 |
| ORNL | 3 | 0.36012176 | 0.63987824 | 0 |
| ORNL | 21 | 1 | 0 | 0 |
| ORNL | 29 | 0.45991508 | 0.53947474 | 0.00061018 |
| ORNL | 37 | 0.1857673 | 0.8142327 | 0 |
| ORNL | 43 | 0.28020524 | 0.71962444 | 0.00017032 |
| ORNL | 46 | 0.65660068 | 0.34326773 | 0.00013159 |
| ORNL | 49 | 0.87531323 | 0.12468677 | 0 |
| SERC | 1 | 1 | 0 | 0 |
| SERC | 2 | 0.50699133 | 0.49300867 | 0 |
| SERC | 3 | 0.91163537 | 0.08836463 | 0 |
| SERC | 5 | 0.77561132 | 0.22438868 | 0 |
| SERC | 45 | 0.3535429 | 0.64237524 | 0.00408186 |
| SERC | 47 | 0.41573443 | 0.58421976 | 4.58E-05 |
| SERC | 49 | 0.24009567 | 0.75990433 | 0 |
| TREE | 1 | 0.00127899 | 0.99872101 | 0 |
| TREE | 2 | 0.00101021 | 0.99898979 | 0 |
| TREE | 3 | 0.99899725 | 0.00100275 | 0 |
| TREE | 6 | 0.31994426 | 0.68005574 | 0 |
| TREE | 14 | 0.90922087 | 0.09077913 | 0 |
| TREE | 41 | 0.96148262 | 0.03851738 | 0 |

Table S2. Random effects of Site from models presented in Table 2: the concentrations and proportions of C and N in MAOM from plots located within seven forests in the National Ecological Observatory Network (NEON)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Proportion of C** | **Concentration of C** | **Proportion of N** | **Concentration of N** |
| σ2 | 0.00 | 36.93 | 0.00 | 0.13 |
| ICC | 0.09 | 0.54 | 0.02 | 0.30 |
| Marginal R2/Conditional R2 | 0.330/ 0.391 | 0.281/0.667 | 0.400/0.413 | 0.479/0.635 |

Table S3. Random effects of Site from models presented in Table 3: C:N in fPOM, oPOM, and MAOM from plots located within seven forests in the National Ecological Observatory Network (NEON)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **fPOM C:N** | **oPOM C:N** | **MAOM C:N** |
| σ2 | 25.787 | 39.667 | 4.912 |
| ICC | 0.130 | 0.217 | 0.490 |
| Marginal R2/Conditional R2 | 0.243/ 0.341 | 0.221/0.391 | 0.509/0.750 |

Table S4. Random effects of Site from models presented in Table 4: MAOM δ13C and Δ14C from plots located within seven forests in the National Ecological Observatory Network (NEON)

|  |  |  |
| --- | --- | --- |
|  | **MAOM δ13C** | **MAOM Δ14C** |
| σ2 | 0.16 | 564.47 |
| ICC | 0.02 | 0.74 |
| Marginal R2/Conditional R2 | 0.259/0.259 | 0.082/0.761 |

Figure S1. Proportions of total soil N in the a) free particulate fraction (NfPOM), b) occluded particulate fraction (NoPOM, and c) mineral-associated organic matter (NMAOM) fraction in plots situated along a gradient of tree mycorrhizal dominance in seven forested NEON sites (see Table 1 for site definitions). Points represent individual plots within each study site (n=46). Lines reflect the best fit from linear models specific to each study site.



Figure S2. Mean annual litterfall collected per sampling trap area within forest plots in seven National Ecological Observatory Network (NEON) sites. Annual masses of leaf and needle litter falling within each plot were averaged for the years with available and complete litterfall data, which varied by site and ranged from 2016 to 2019. Litterfall mass is plotted against the relative percentage of tree basal area represented by tree species with known associations with ectomycorrhizal (ECM) fungi. Solid lines indicate significant relationships at α=0.05.



Figure S3. Trends in MAOM carbon isotope ratios with climate decomposition index (CDI), % ECM tree basal area, and oxalate-extractable iron content from soil samples collected within six forests in the National Ecological Observatory Network (NEON). Solid lines indicate significant linear relationships at α=0.05. See Tables 4 and S4 for results of statistical models.

