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## *Plants, People, Planet* Supporting Information

Article title: Informing forest carbon inventories under the Paris Agreement using ground-based forest monitoring data

Authors: Kristina J. Anderson-Teixeira, Valentine Herrmann, Madison Williams, Teagan Rogers, Rebecca Banbury Morgan, Ben Bond-Lamberty, Susan Cook-Patton

The following Supporting Information is available for this article:

**Table S1** Updates to ForC fields implemented between releases of v3.0 and v4.0.

**Table S2** Mapping of ForC fields to EFDB.

**Table S3** Numbers of ForC records and EFDB submissions by variable.

**Table S1. Updates to ForC fields implemented between releases of v3.0 and v4.0.**

| Table | Field | Description | Changes | Motivation |
| --- | --- | --- | --- | --- |
| Sites | coordinates.precision | Precision of geographic coordinates, as reported by source or estimated from maps. | field added | allow identification of records with poor coordinate precision |
| Measurements | data.location.within.source | Location of data within the source listed in citation.ID. | field added | facilitate review, ensure traceability |
|  | sd, se, lower95%CI, upper 95%CI | Standard deviation, standard error, and lower and upper 95 percent confidence intvervals, respectively. | replaces `stat` and `stat.name` | cleaner format; ability to handle assymetrical 95 percent confidence intervals |
|  | mean.in.original.units, original.units | mean value and units presented in original publication | fields added | provide IPCC's EFDB with original units, reduce errors/improve reproducibility |
|  | C.conversion.factor | Assumed/ measured C content of organic matter used to convert organic matter to C. | field added | track units conversion, allow back-calculation of OM if conversion factor deemed inappropriate |
| PFT | description | Definition of the pftcode at the community level. Differs from individual level in that properly describes mixed plant functional types. | field added | clarify PFT at community and individual levels |
|  | description.individual | Definition of the pftcode at the individual plant level. | field name change (previously `description`) | clarify PFT at community and individual levels |
| Citations | citation.citation | Full citation. Most of these records are automatically generated in R based upon DOI lookup. | field added | field required by IPCC's EFDB |
|  | citation.language | Language of original publication, automatically generated based on the title and abstract, with some manual entries and corrections. | field added | field required by IPCC's EFDB |
|  | citation.url | URL of original publication, generally retrieved automatically via URL lookup. | field added | field required by IPCC's EFDB |
|  | citation.abstract | Abstract, generally retrieved automatically via DOI lookup. | field added | field required by IPCC's EFDB |
|  | source.type | citation source type | field added | field required by IPCC's EFDB |

**Table S2. Mapping of ForC fields to EFDB.** Details documented in the public GitHub repository associated with the project, IPCC-EFDB-integration repository within the ForC-db organization (file *ForC-EFDB\_mapping.csv* available at <https://github.com/forc-db/IPCC-EFDB-integration/blob/main/doc/ForC-EFDB_mapping/ForC-EFDB_mapping.csv>).

| ForC table | ForC field | EFDB field | Usage | Required\* |
| --- | --- | --- | --- | --- |
| Measurements | measurement.ID | Other Properties | direct mapping | (no) |
|  | dominant.life.form | 1996 Source/Sink Categories, 2006 Source/Sink Categories | used to determine land subcategories (see defining\_land\_subcategory.md) | yes |
|  | stand.age | 1996 Source/Sink Categories, 2006 Source/Sink Categories, Parameters/ Conditions | used to determine land subcategories (see defining\_land\_subcategory.md), directly listed in Parameters/ Conditions | (yes) |
|  | dominant.veg, veg.notes, min.dbh | Parameters/ Conditions | direct mapping/ linking to dominant.veg description | no |
|  | variable.name | - | link to variable info in ForC\_variables table | yes |
|  | date / start.date, end.date | Other Properties | direct mapping | no |
|  | mean | Value | direct mapping | yes |
|  | mean.in.original.units | Value in Common Units | direct mapping | yes |
|  | original.units | Common Unit | direct mapping | yes |
|  | lower95%CI, upper 95%CI, se, sd and n | Lower Confidence Limit, Upper Confidence Limit | direct or calculated | (yes) |
|  | depth, covariate\_1, cov\_1.value, covariate\_2, cov\_2.value | Other Properties | direct mapping | no |
|  | allometry\_1, allometry\_2 | Comments from Data Provider | link to biomass allometry source, when provided | no |
|  | data.location.within.source | - | confirm that data weren't digitized, facilitate finding data in original publication | yes |
|  | ForC.investigator | Data Provider, Data Provider Contact | link to Data Provider, Data Provider Contact info | yes |
| Sites | site.ID, sites.sitename | Other Properties | direct mapping | (no) |
|  | lat, lon | Region/Regional conditions | direct mapping; used to extract continent, Koeppen, and FAO.ecozone | (no) |
|  | country, state, city, masl, mat, map | Region/Regional conditions | direct mapping | no |
|  | continent, Koeppen | Region/Regional conditions | direct mapping | auto |
|  | soil.texture, sand, silt, clay, soil.classification | Parameters/ Conditions | direct mapping | no |
|  | FAO.ecozone | Parameters/ Conditions | direct mapping | auto |
| History | date, hist.cat, hist.type | 1996 Source/Sink Categories, 2006 Source/Sink Categories, Abatement/Control technologies | used to determine distmrs.type for Source/Sink Categories, generate list of events for Abatement/Control technologies | most recent severe disturbance: (yes) / other history events: no |
|  | plot.area | Other Properties | direct mapping | no |
| Plots | plot.ID, plot.name | Other Properties | direct mapping | (no) |
|  | distmrs.type | 1996 Source/Sink Categories, 2006 Source/Sink Categories | used to determine land subcategories (see defining\_land\_subcategory.md) | auto |
|  | distmrs.type, distmrs.year, regrowth.type, regrowth.year | Other Properties | direct mapping | auto |
| PFT | description | Parameters/ Conditions | direct mapping | auto |
| variables | variable.type | Gases | For stocks in unit of organic matter, gases include CO2, CO, CH4, NO, NO2, N2O. For increments, fluxes, and stocks in units of C, gases includes only CO2. | auto |
|  | variable.name | C pool, Equation | link to C pool, Equation | auto |
|  | description | Description | direct mapping | auto |
|  | extended.description | Other Properties | direct mapping | auto |
|  | units | Unit (ID) | link to IPCC units | auto |
| Citations | citation.citation | Full Technical Reference | direct mapping | yes/auto |
|  | citation.language | Reference Language | direct mapping | yes/auto |
|  | citation.url | URL | direct mapping | no/auto |
|  | citation.abstract | Abstract in English | direct mapping | no/auto |
|  | source.type | Source of Data | direct mapping | yes |

\* *Required* field indicates whether the field is required by EFDB: yes = value required; (yes) = input required, missing value acceptable if not reported; auto = present within ForC infrasructure, and therefore will always be exported to EFDB ; (no) = not required for EFDB, but required for ForC and therefore will always be exported to EFDB; no = not required, but exported to EFDB when a value is present.

**Table S3.** **Numbers of ForC records and EFDB submissions by variable.**

| **variable** | **n in ForC** | **n independent records in ForC** | **n reviewed** | **n submitted to EFDB** |
| --- | --- | --- | --- | --- |
| **Biomass** |  |  |  |  |
| biomass | 1094 | 850 | 95 | 50 |
| delta.biomass | 0 | 0 | 0 | 0 |
| NPP\_woody | 136 | 93 | 0 | 0 |
| woody.mortality | 0 | 0 | 0 | 0 |
| **Aboveground biomass** |  |  |  |  |
| biomass\_ag | 9449 | 8148 | 1357 | 764 |
| biomass\_ag\_woody | 460 | 366 | 10 | 10 |
| biomass\_ag\_foliage | 601 | 520 | 73 | 45 |
| delta.agb | 166 | 150 | 145 | 123 |
| ANPP\_woody | 299 | 242 | 0 | 0 |
| ANPP\_woody\_stem | 949 | 622 | 60 | 61 |
| ANPP\_woody\_branch | 243 | 200 | 4 | 4 |
| woody.mortality\_ag | 112 | 75 | 47 | 50 |
| stem\_pC | 9 | 0 | 0 | 0 |
| **Belowground biomass** |  |  |  |  |
| biomass\_root | 4629 | 4185 | 125 | 57 |
| biomass\_root\_fine | 930 | 595 | 18 | 18 |
| biomass\_root\_coarse | 599 | 413 | 12 | 7 |
| delta.biomass\_root | 0 | 0 | 0 | 0 |
| delta.biomass\_root\_coarse | 0 | 0 | 0 | 0 |
| delta.biomass\_root\_fine | 0 | 0 | 0 | 0 |
| woody.mortality\_root | 0 | 0 | 0 | 0 |
| BNPP\_root | 577 | 416 | 0 | 0 |
| BNPP\_root\_fine | 488 | 331 | 0 | 0 |
| BNPP\_root.turnover\_fine | 91 | 56 | 0 | 0 |
| BNPP\_root\_coarse | 329 | 250 | 0 | 0 |
| **Dead wood** |  |  |  |  |
| deadwood | 438 | 304 | 104 | 70 |
| deadwood\_standing | 153 | 121 | 18 | 17 |
| deadwood\_down | 425 | 369 | 52 | 28 |
| delta.deadwood | 0 | 0 | 0 | 0 |
| delta.deadwood\_standing | 0 | 0 | 0 | 0 |
| delta.deadwood\_down | 0 | 0 | 0 | 0 |
| R\_het\_deadwood | 0 | 0 | 0 | 0 |
| **Litter** |  |  |  |  |
| O.horizon | 45 | 45 | 45 | 40 |
| delta.O.horizon | 4 | 4 | 4 | 4 |
| litter | 30 | 30 | 23 | 23 |
| delta.litter | 0 | 0 | 0 | 0 |
| ANPP\_litterfall | 294 | 253 | 11 | 11 |
| NPP\_litter | 94 | 70 | 0 | 0 |
| R\_het\_litter | 167 | 143 | 0 | 0 |
| **Total Ecosystem C (excl. soils)** |  |  |  |  |
| total.ecosystem\_2 | 64 | 64 | 0 | 0 |
| delta.total.ecosystem\_2 | 0 | 0 | 0 | 0 |
| **Soil organic matter** |  |  |  |  |
| SOM / SOC | 693 | 401 | 89 | 56 |
| delta.SOM / delta.SOC | 0 | 0 | 0 | 0 |
| **TOTAL** | **23568** | **19316** | **2292** | **1438** |

**Methods S1** Click here to enter text.

**Notes S1** Click here to enter text.

**Movie S1** Click here to enter text. [Note: Movie files must be submitted separately and should not be included in this file]

**Code S1** Click here to enter text. [e.g. R Script can be submitted separately]

**Dataset S1** Click here to enter text. [Large datasets such as Excel Workbooks can be submitted separately. Please insert a title page in the dataset document that includes the title of the paper, the author list and legend for the dataset]