

Supplement of Geosci. Model Dev., 13, 3203–3220, 2020
<https://doi.org/10.5194/gmd-13-3203-2020-supplement>
© Author(s) 2020. This work is distributed under
the Creative Commons Attribution 4.0 License.



Supplement of

Global rules for translating land-use change (LUH2) to land-cover change for CMIP6 using GLM2

Lei Ma et al.

Correspondence to: Lei Ma (lma6@umd.edu)

The copyright of individual parts of the supplement might differ from the CC BY 4.0 License.

Supplementary

Table. S1. Legend translation to produce a common forest canopy cover for various land cover datasets based on (Song et al., 2014). For references see Table. 2.

Products	Land cover class	Fraction
GLCC, MODIS LC	Forest (evergreen needleleaf; deciduous needleleaf; evergreen broadleaf; evergreen needleleaf; mixed)	0.80
	Woody savannas	0.45
	Cropland/Natural Vegetation Mosaic	0.25
	Savannas	0.20
	Open shrublands; closed shrublands; grasslands; croplands; urban and build-up; snow and ice; water bodies; permanent wetlands; barren or sparsely vegetated	0
GLC2000	Tree cover (evergreen broadleaved, closed deciduous broadleaved)	0.70
	Tree cover (evergreen needleleaf; deciduous needleleaf; mixed leaf type; regularly flooded fresh or saline)	0.575
	Mosaic: Tree cover/other natural vegetation	0.50
	Tree cover (open deciduous broadleaved)	0.275
	Mosaic: cropland/tree cover/ other natural vegetation	0.25
	Tree cover burnt; shrub cover (evergreen, deciduous); herbaceous cover; sparse herbaceous or sparse shrub cover; regularly flooded shrub and/or herbaceous cover; cultivated and managed areas; mosaic: cropland / Shrub and/or grass cover; bare areas; water bodies; snow and ice; artificial surfaces and associated areas	0
GlobCover	Closed forest (broadleaved deciduous; needle leaved evergreen)	0.70
	Closed to open forest (broadleaved evergreen or semi-deciduous, mixed broadleaved and needle leaved, broadleaved forest regularly flooded)	0.575
	Open broadleaved deciduous forest/woodland; open needle leaved deciduous or evergreen forest;	0.30
	Mosaic vegetation (grassland/shrubland/forest) / cropland; mosaic forest or shrubland / grassland	0.20
	Mosaic grassland / forest or shrubland	0.175
	Mosaic cropland / vegetation (grassland/shrubland/forest)	0.117
	Post-flooding or irrigated croplands (or aquatic); rainfed croplands; closed to open (broadleaved or needle leaved, evergreen or deciduous); closed to open herbaceous vegetation (grassland, savannas or lichens/mosses); sparse vegetation; closed broadleaved forest or shrubland permanently flooded; closed to open grassland or woody vegetation on regularly flooded or waterlogged soil; artificial surfaces and associated areas; bare areas; water bodies; permanent snow and ice	0

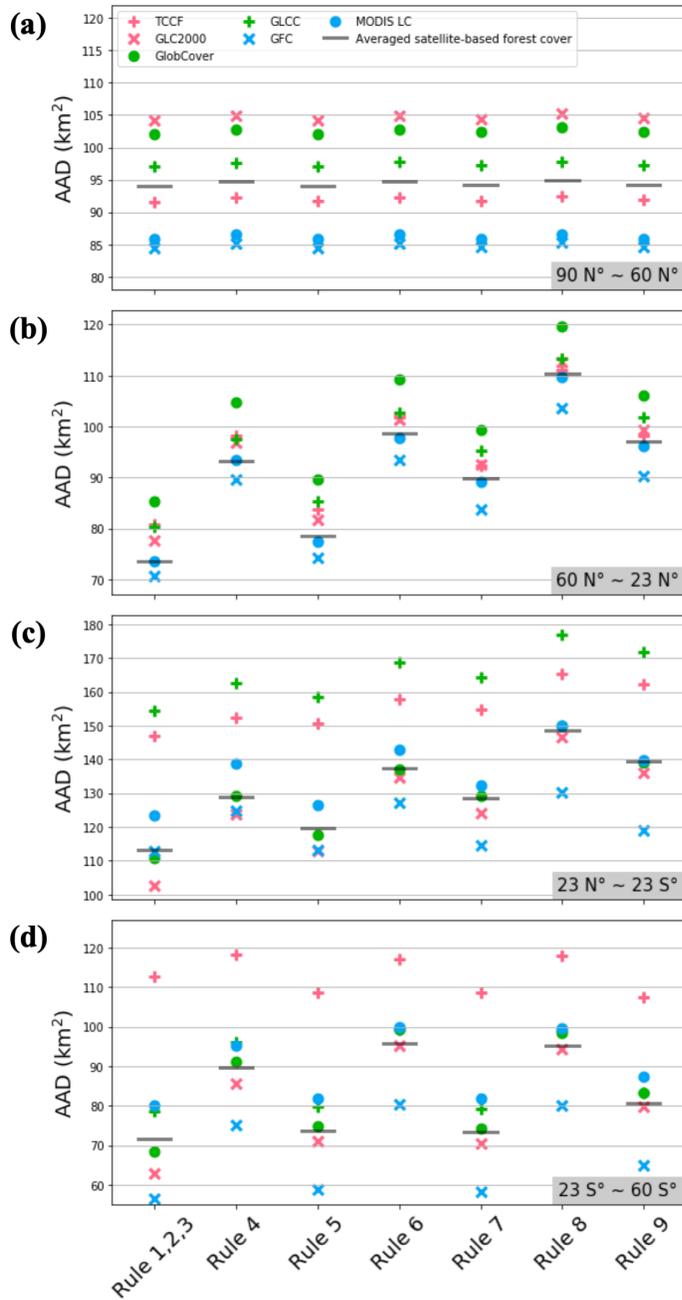


Figure S1. Regional average of absolute difference in forest area between maps estimated by translation rules, and six satellite-based forest cover maps and the averaged satellite-based forest cover map.

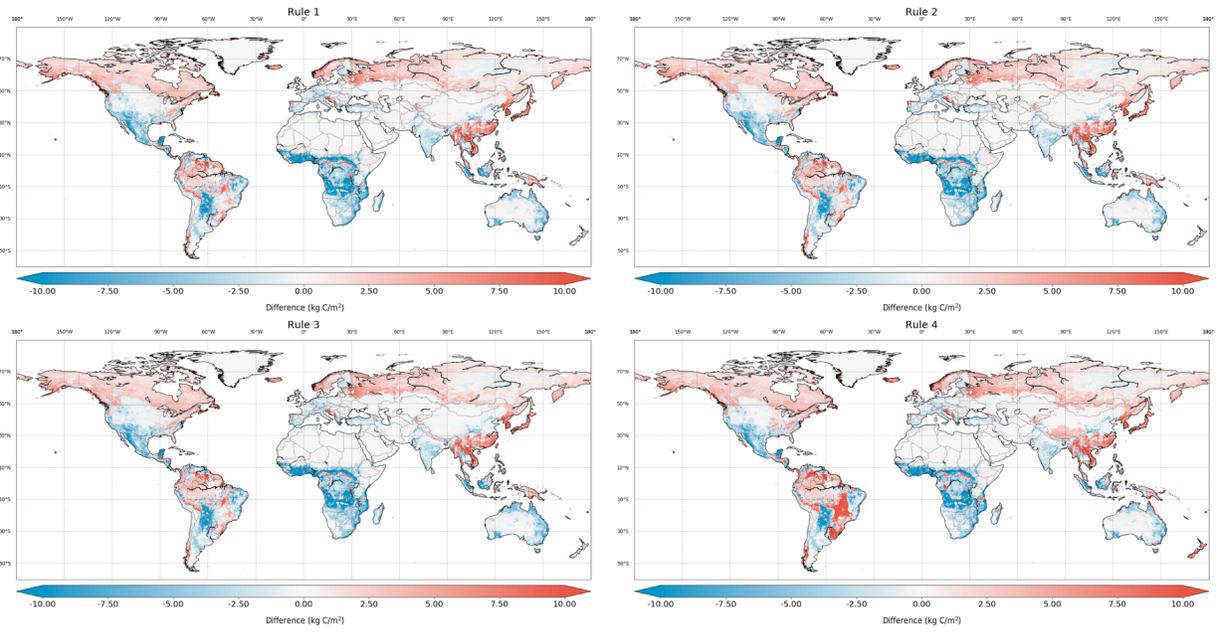


Figure S2. Global carbon density difference between IPCC biomass Tier-1 (Figure 7a) density map and estimates of Rules 1-4 from (a) to (d).

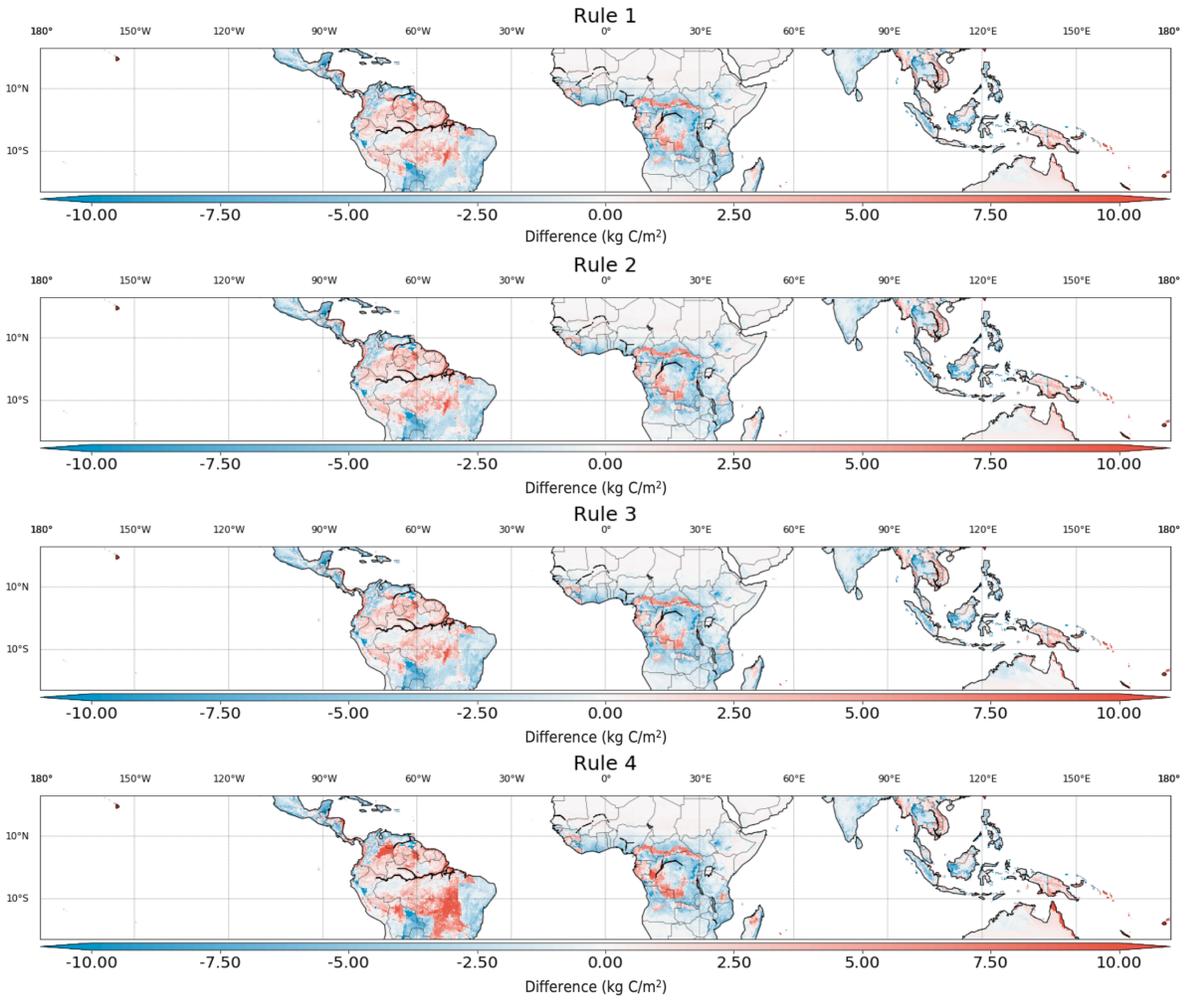


Figure S3. Global carbon density difference between the Baccini's product (Figure 7b) and estimates of Rules 1-4 from (a) to (d).

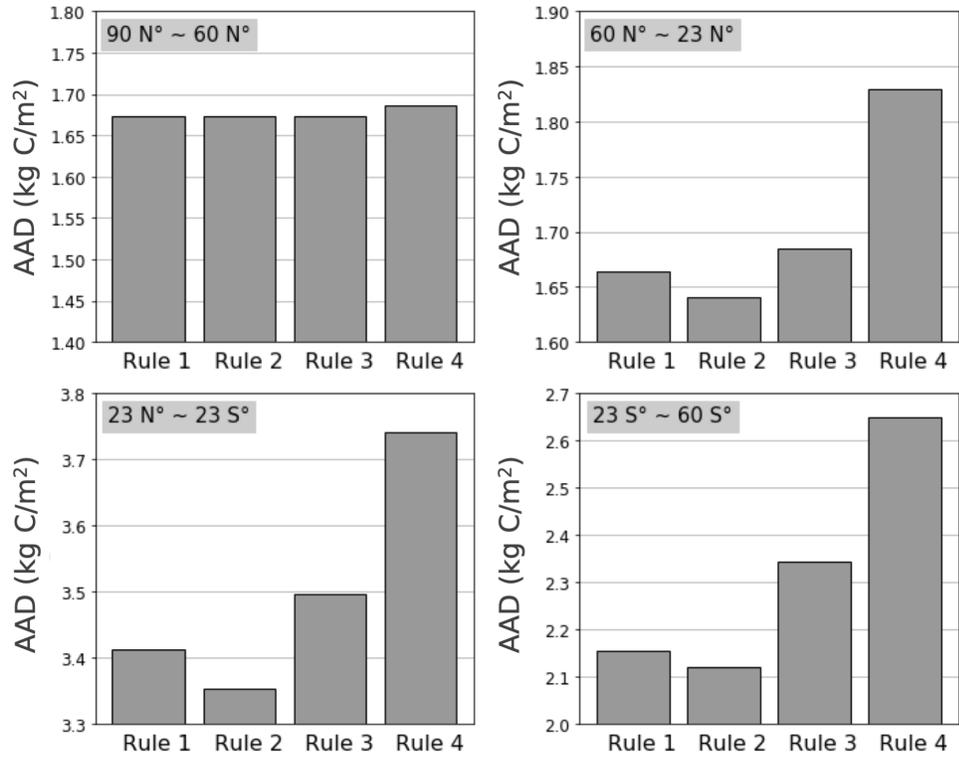


Figure S4. Average of absolute difference in carbon density between estimations of the Rules 1-4 and the IPCC Tier-1 biomass density map at different latitudinal band zones.

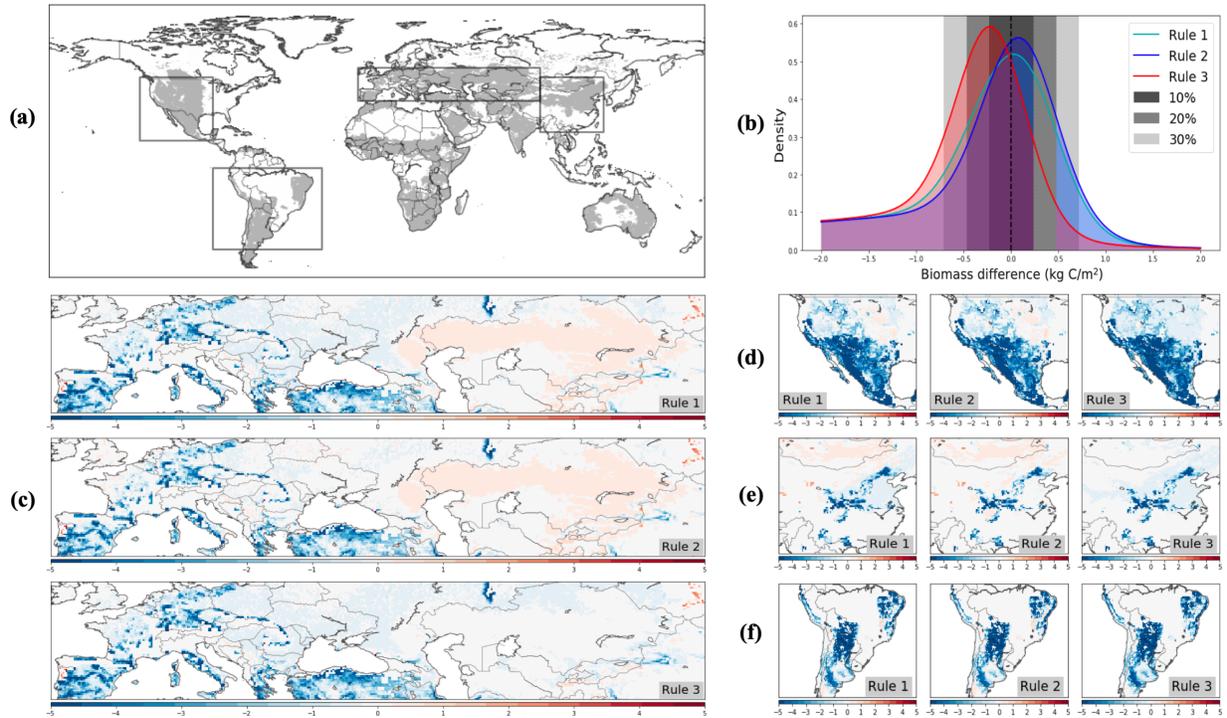


Figure S5. Carbon density difference comparison between the IPCC Tier-1 biomass density map and estimation of Rules 1-3. (a) Shaded regions represent where Rules 1-3 differ in estimates of carbon density; (b) Histogram of carbon density difference of shaded regions in (a), shared bounds present shift range of zero line under three assumed bias levels of the IPCC Tier-1 biomass. (c) – (f) are regional comparison of carbon density difference of Rules 1-3, regions where Rules 1-3 have the same estimate of carbon density are not shown.

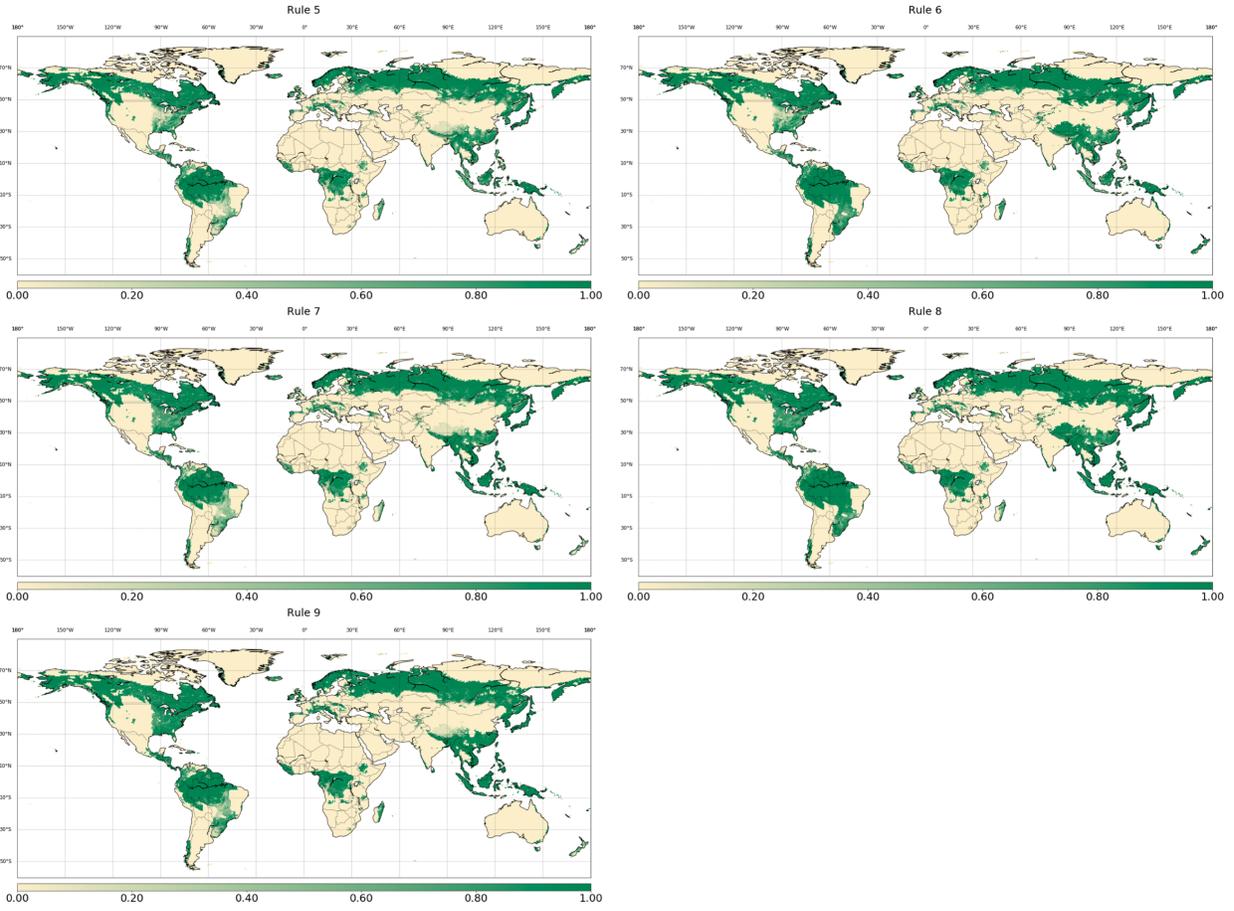


Figure S6. Forest cover in 2000 from the Rules 5-9 respectively.

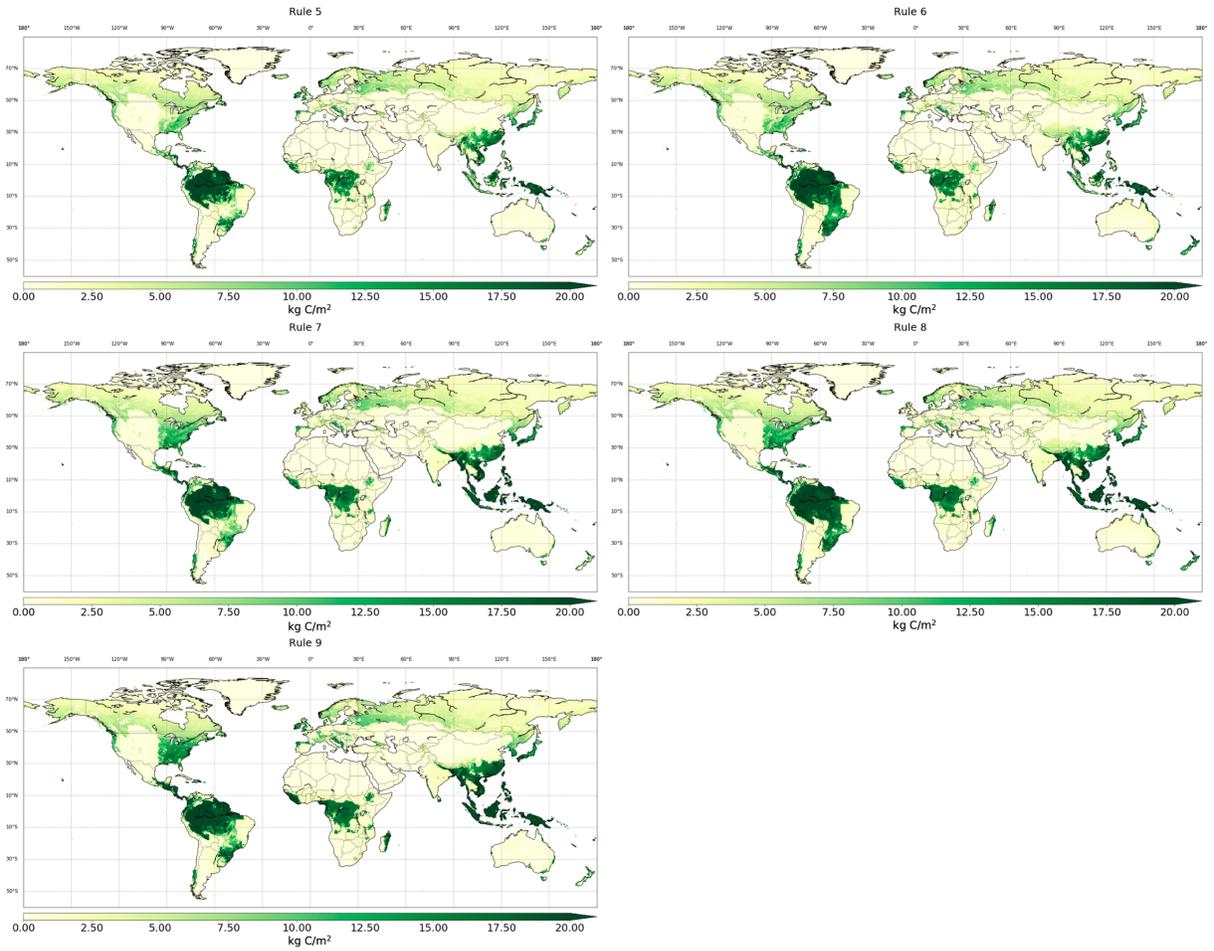


Figure S7. Global carbon density (above- and below-ground) maps estimated by Rules 5-9 respectively.