1 **Supplementary materials for**

2 **Calibration and analysis of the uncertainty in downscaling global land use and**

3 **land cover projections from GCAM**

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13   Table S1. Conversion table from CCI-LC product groups to Final Land Types (FLTs).

CCI-LC groups	FLTs
no_data	No data
cropland_rainfed	Crop
cropland_rainfed_herbaceous_cover	Crop
cropland_rainfed_tree_or_shrub_cover	Crop
cropland_irrigated	Crop
mosaic_cropland	Crop
mosaic_natural_vegetation	Crop
tree_broadleaved_evergreen_closed_to_open	Forest
tree_broadleaved_deciduous_closed_to_open	Forest
tree_broadleaved_deciduous_closed	Forest
tree_broadleaved_deciduous_open	Forest
tree_needleleaved_evergreen_closed_to_open	Forest
tree_needleleaved_evergreen_closed	Forest
tree_needleleaved_evergreen_open	Forest
tree_needleleaved_deciduous_closed_to_open	Forest
tree_needleleaved_deciduous_closed	Forest
tree_needleleaved_deciduous_open	Forest
tree_mixed	Forest
mosaic_tree_and_shrub	Forest
mosaic_herbaceous	Grass
shrubland	Shrub
shrubland_evergreen	Shrub
shrubland_deciduous	Shrub
grassland	Grass
lichens_and_mosses	Grass
sparse_vegetation	Sparse
sparse_shrub	Sparse
sparse_herbaceous	Sparse
tree_cover_flooded_fresh_or_brakish_water	Sparse
tree_cover_flooded_saline_water	Forest
shrub_or_herbaceous_cover_flooded	Shrub
urban	Urban
bare_areas	Sparse
bare_areas_consolidated	Sparse
bare_areas_unconsolidated	Sparse
water	No data
snow_and_ice	Snow

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15 Figure S1. Spatial pattern of the observed and downscaled Forest density (measured by

16 percentage fraction of the grid cell), and their differences in 2015.

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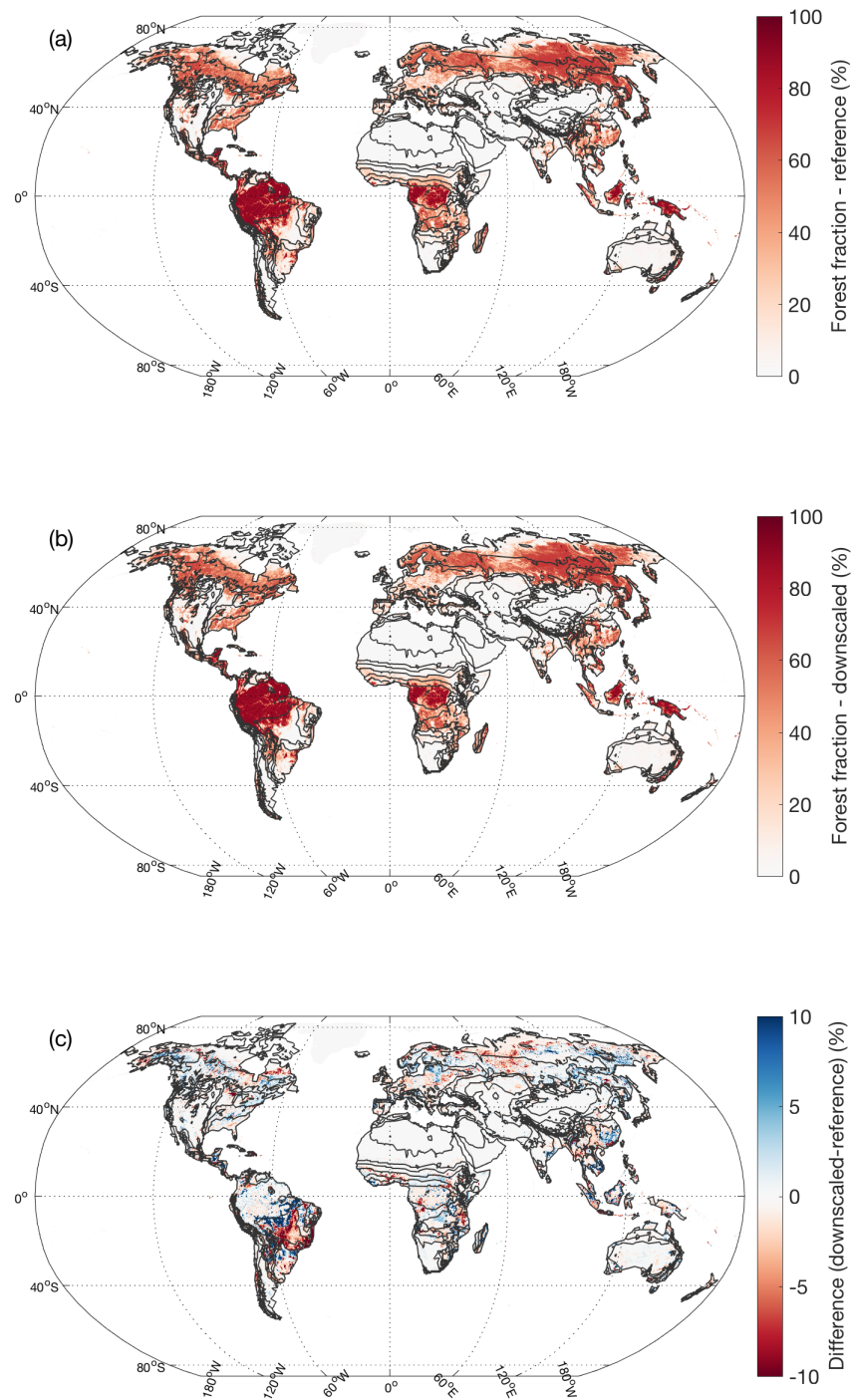
19   Figure S2. Spatial pattern of the observed and downscaled Shrub density (measured by

20   percentage fraction of the grid cell), and their differences in 2015.

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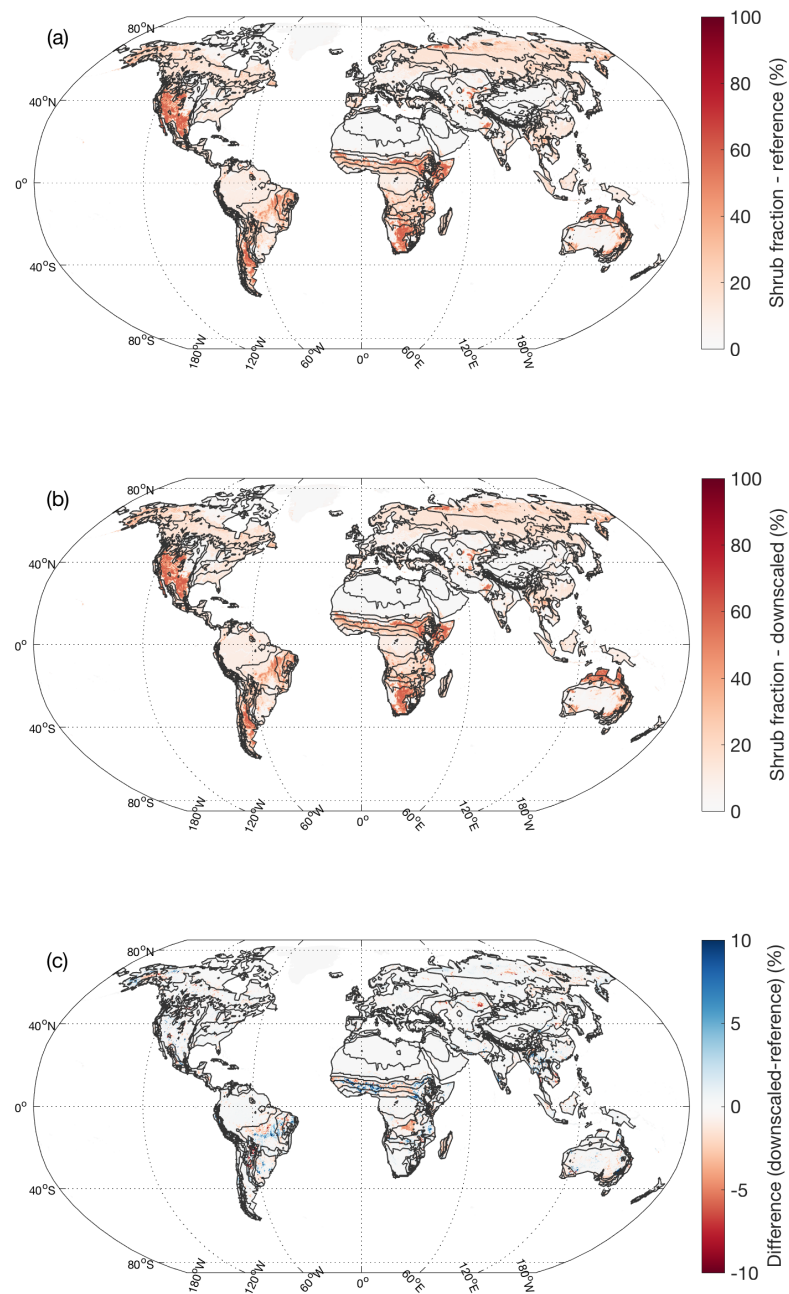
22   Figure S3. Spatial pattern of the observed and downscaled Grass density (measured by

23   percentage fraction of the grid cell), and their differences in 2015.

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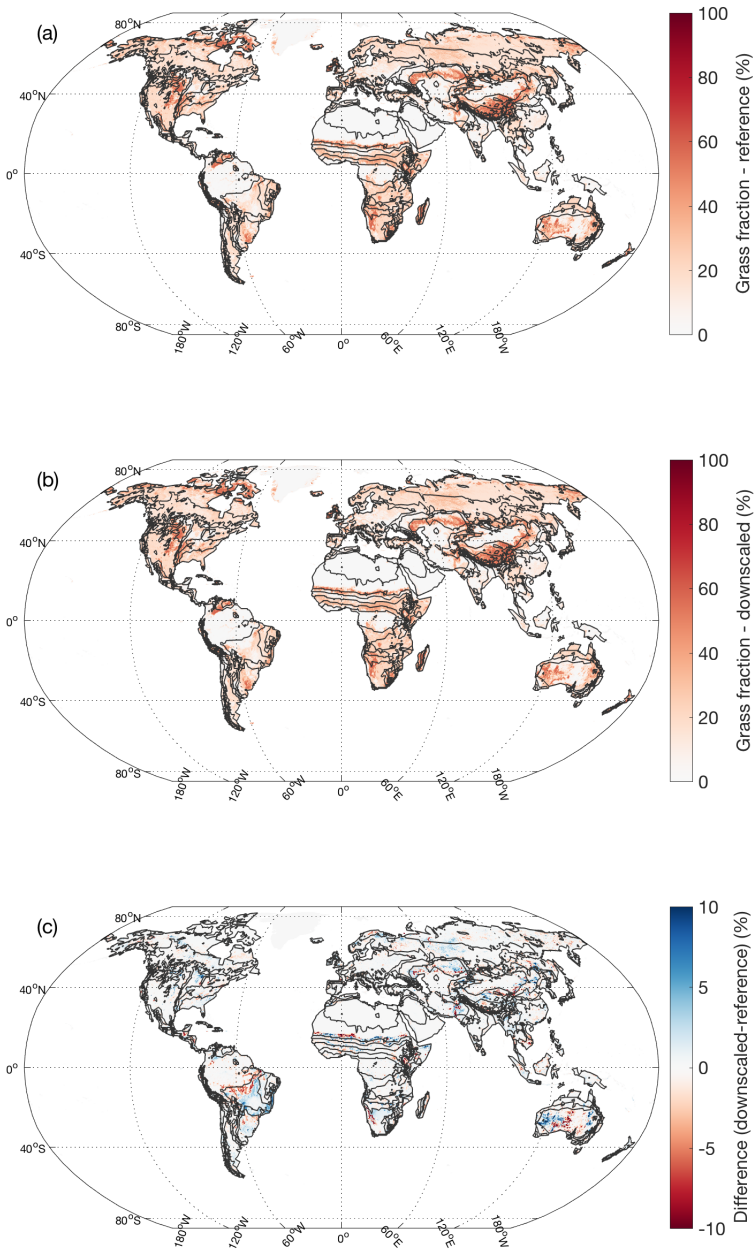
25   Figure S4. Spatial pattern of the observed and downscaled Urban density (measured by

26   percentage fraction of the grid cell), and their differences in 2015.

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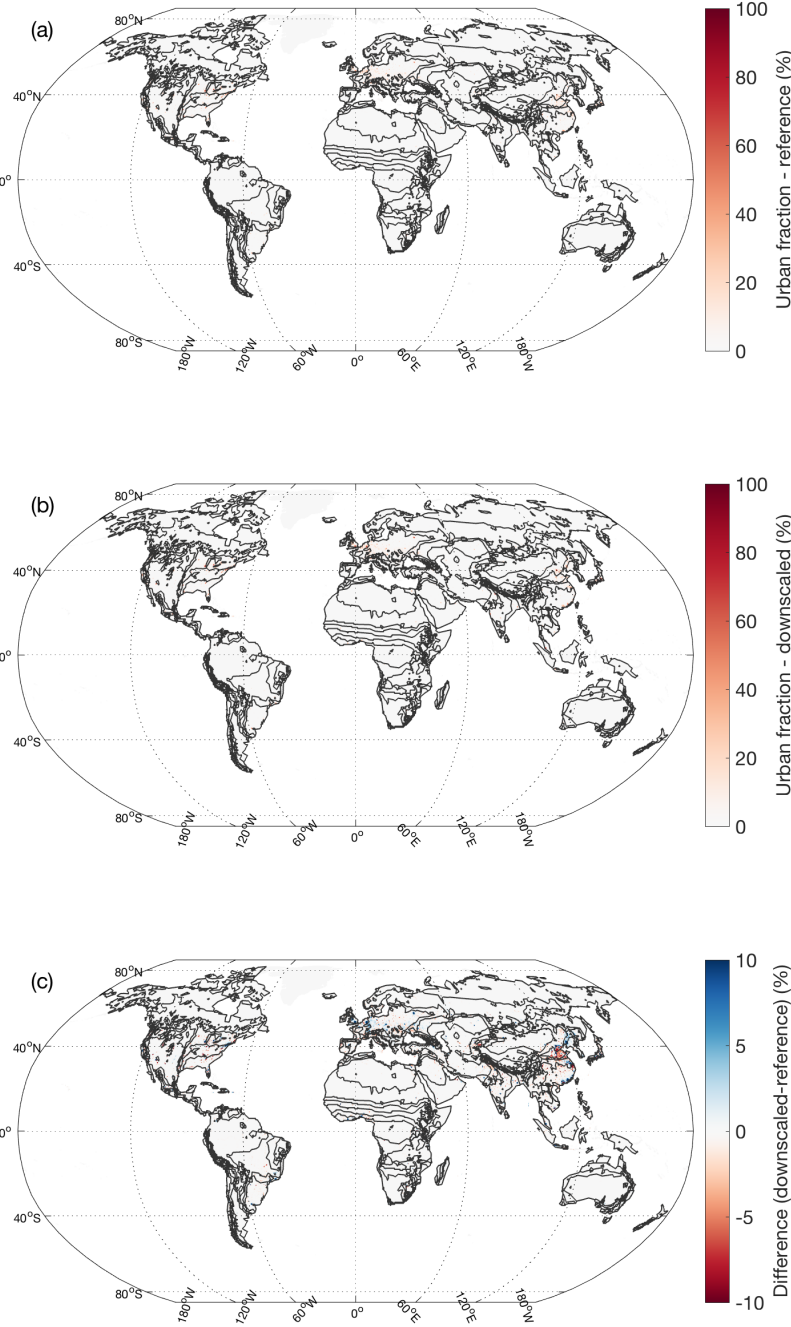
29   Figure S5. Spatial pattern of the observed and downscaled Sparse density (measured by

30   percentage fraction of the grid cell), and their differences in 2015.

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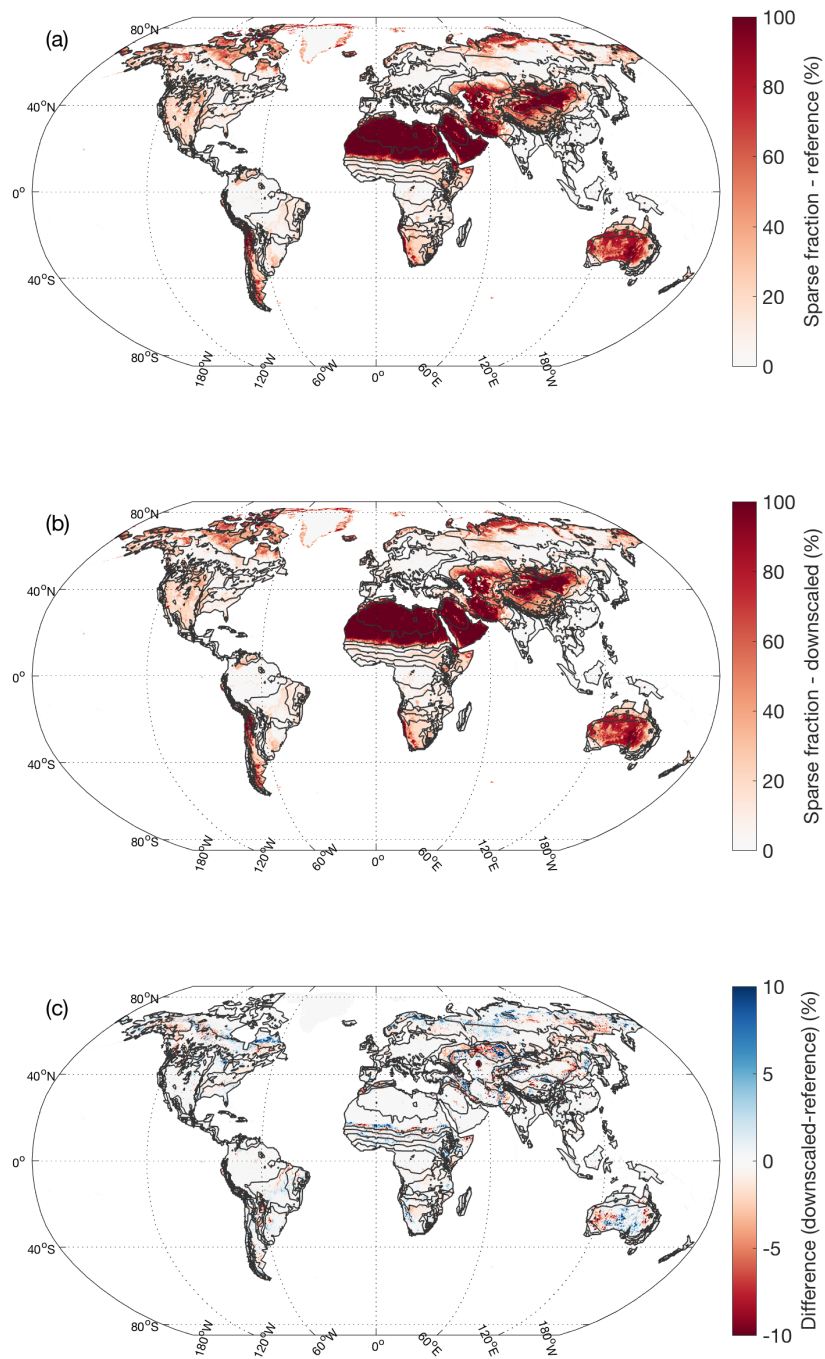
32   Figure S6. Mean and standard deviations (σ) for the downscaled Final Land Type (FLT)
33   densities (measured by the percentage fraction of the grid cells) for each FLT and year, when
34   propagating the parameter uncertainties into the GCAM-projected land use and land cover
35   change downscaling in the 21st century. The color and the height of the bars indicated the mean
36   and standard deviation, respectively.

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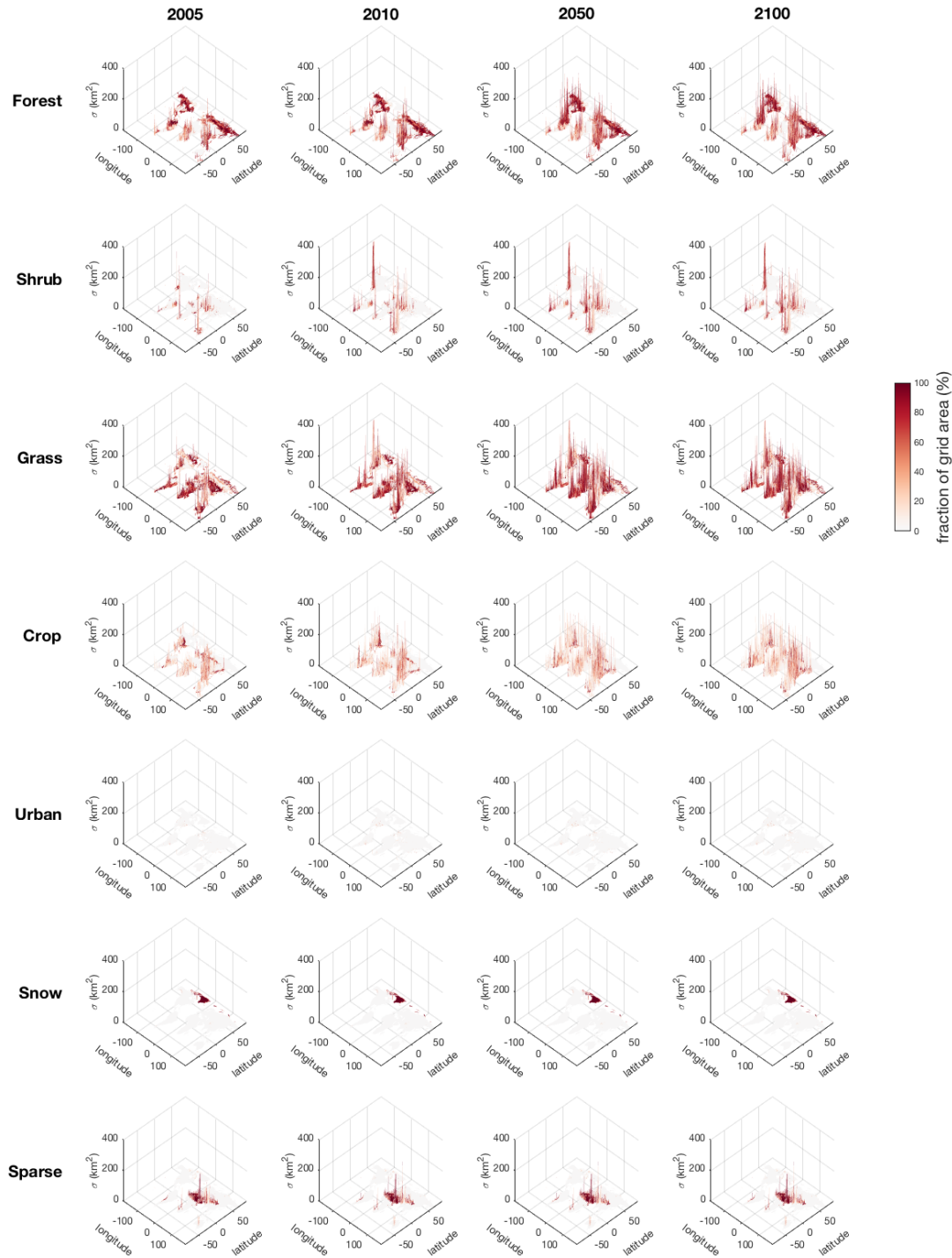
39   Figure S7. Possibility distributions of the 'best' 5% parameters for India (a) and United States

40   (b). The red lines show the optimal values for the two regions. Note that the values of D were

41   divided by 100 for the purpose of illustration.

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