

**Supplementary Table S1.** Scheme of land cover types reclassification

Land cover	Types of MCD12Q1
Grassland (1)	Dominated by woody perennials (1-2m height), >60% cover (6); Dominated by woody perennial cover (7); Dominated by herbaceous annuals (< 2m) (10); permanently inundated lands with 30-60% vegetation cover (11); at least 60% of area is non-vegetation barren (sand, rock, soil) areas with less than 10% vegetation cover (12).
Forest (2)	Dominated by evergreen conifer trees (canopy > 2m), tree cover >60% (1); Dominated by evergreen trees (canopy > 2m), tree cover >60% (2); Dominated by deciduous needleleaf (larch) trees (canopy > 2m), tree cover >60% (3); Dominated by deciduous broadleaf trees (canopy > 2m), tree cover >60% (4); Dominated by evergreen (40-60% of each) tree type (canopy > 2m), tree cover >60% (5); tree cover 30-60% (canopy > 2m) (6); tree cover 10-30% (canopy > 2m) (9).
Water bodies (3)	At least 60% of area is covered permanent water bodies (17).
Permanent snow and ice (4)	At least 60% of area is covered by snow and ice for at least 10 months of the year (15).
Others (5)	At least 60% of area is cultivated cropland (12); at least 30% impervious surface area including buildings and vehicles (13); mosaics of small-scale cultivation 40-60% with nature tree, shrub, or herbaceous vegetation (14).