Supplementary material for *“Challenges and opportunities in mapping land use intensity globally”*

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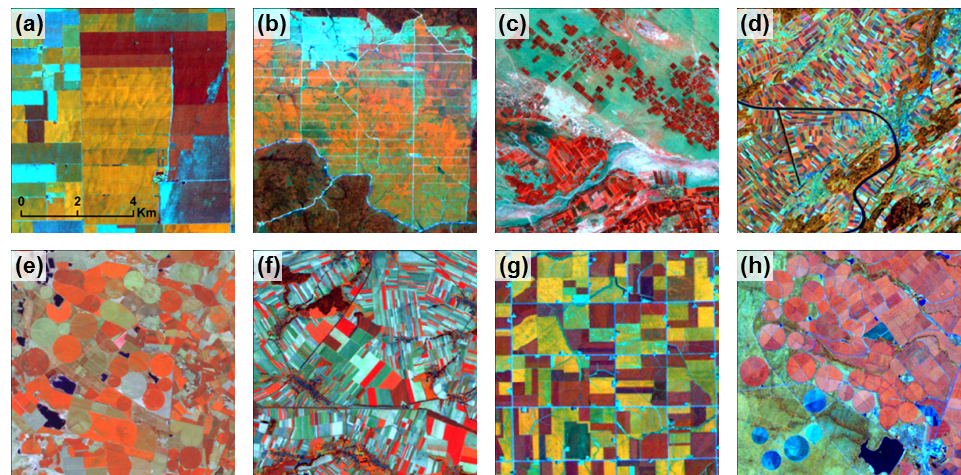
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Available global, grid-level metrics for characterizing land use intensity (General format: Dataset (citation/source, scale, reference year/s)). Note that these metrics are of varying accuracy, spatial detail, and consistency (see Discussion section).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | *Cropland systems* | *Grazing systems* | *Forestry systems* |
| *INPUT METRICS* | *Land utilized* | * Cropland extent   + Global Land Cover (GLC) 2000 [[1, 1km resolution, reference year = 2000](#_ENREF_1)]   + MODIS Land Cover [[2, 500m, annually 2000-2012](#_ENREF_2)]   + GlobCover (http://ionia1.esrin.esa.int, 300m, 2006 and 2009)   + UMD Global Land Cover Classification [[3, 1km, 1992/1993](#_ENREF_3)]   + Hybrid map [[4, 5min, 2000](#_ENREF_4)]   + SYNMAP [[5, 1km, 2000](#_ENREF_5)] * Global cropland extent [[6, 5min, 2000](#_ENREF_6)]   + Several historic time series of cropland extent [[7-10](#_ENREF_7)] * Cultivated area for 175 crops [[11, 5min, 2000](#_ENREF_11)] * Global crop type distribution [[12, 10km, ~2000](#_ENREF_12)] * Cropping intensity & fallow land [[13, 5min, 2000](#_ENREF_13)] * Irrigated lands * GIAM [[14, 1km, 2000](#_ENREF_14)] * Land equipped for irrigation [[15, 5min, 2000](#_ENREF_15)] * Monthly irrigated areas [[16, 5min, 2000](#_ENREF_16)] * Area equipped for drainage [[17, 5min, ,~2005](#_ENREF_17)] | * Pasture extent * Pasture area [[4, 10km, 2000, coarser resolution time series since 1700 available online](#_ENREF_4)] * Grazing area [[6, 5min, 2000](#_ENREF_6)] * HYDE 3.1 [[7, 5 min., 2000](#_ENREF_7)] * Several historic time series of pasture land are available [[7](#_ENREF_7),[8](#_ENREF_8),[18](#_ENREF_18)] * Unused / wild grasslands, savannahs, and rangelands   + Last of the Wild [[19 & http://sedac.ciesin.columbia.edu/wildareas/, 1km, 2000](#_ENREF_19)]   + Human Footprint and Human Influence Index [[19 & http://sedac.ciesin.columbia.edu/wildareas/, 1km, 2000](#_ENREF_19)] | * Forest extent (natural and used as one category)   + GLC2000 (http://bioval.jrc.ec.europa.eu, 1km, 2000)   + MODIS Land Cover [[2, 500m, annually 2000-2012](#_ENREF_2)]   + GlobCover (http://ionia1.esrin.esa.int, 300m, 2006 and 2009)   + UMD Global Land Cover Classification [[3, 1km, 1992/1993](#_ENREF_3)]   + IIASA Dataset [[20, 0.5°, 2005](#_ENREF_20)] * Forest land used for forestry [[6, 5min, 2000](#_ENREF_6)] * Unused / wild forests   + Intact Forest Landscapes [[21, ~1km, ~2000](#_ENREF_21)]   + Last of the Wild [[19 & http://sedac.ciesin.columbia.edu/wildareas/, 1km, 2000](#_ENREF_19)]   + Human Footprint and Human Influence Index [[19 & http://sedac.ciesin.columbia.edu/wildareas/, 1km, 2000](#_ENREF_19)] * Growing stock / biomass / carbon density   + IIASA Dataset [[20, 0.5°, 2005](#_ENREF_20)] * Forest canopy height [[22, 500m, ~2005](#_ENREF_22)] |
| *Other inputs* | * Fertilizer * Industrial and manure fertilizer application rates (N, P) [[23, 10km, 2000](#_ENREF_23)] * Industrial and manure fertilizer application rates (N, P) [[24, 0.5°, 1970-2050](#_ENREF_24)] | * Stocking densities * FAO Gridded livestock of the world [[25, 0.05°, 2000&2005](#_ENREF_25)] * Manure (N, P) from Livestock * Manure production [[23, 10km, 2000](#_ENREF_23)] * Manure production [[26, 0.5°, 1900, 1950, 2000, 2050](#_ENREF_26)] |  |
| *INPUT / OUTPUT METRICS* | *Yield/land ratios* | * Yields for 175 crops [[11, 5min, 2000](#_ENREF_11)] | * Livestock production * FAO Gridded livestock of the world (http://www.fao.org/AG/againfo/resources/en/glw/GLW\_supply.html, 0.05°, 2000) |  |
| *SYSTEM METRICS* | *Yield gaps* | * Wheat, maize and rice yield gap [[27, 5min, ~2000](#_ENREF_27)] * Yield gaps for 18 major crops [[28, 10km, ~2000](#_ENREF_28)] * Yield gap for 12 major crops [[29, 0.5°, ~2000](#_ENREF_29)] |  |  |
| *HANPP* | * Global HANPP [[30, 5 min, 2000](#_ENREF_30)] | | |

Fig. S1: Field size patterns in Landsat Thematic Mapper images from (a) Central Argentina (image from 15 Feb 2011), (b) Borneo, Indonesia (9 March 2000), (c) Inner Mongolia, China (10 Aug 2010), (d) Switzerland (26 June 2003), (e) Southern Spain (15 Aug 2011), (f) Southern Poland (28 July 2006), (g) Iowa, USA (17 July 2005) and (h) Southern Mozambique (25 March 2009). All images are shown in false colors (band combination 4/5/3). All image chips have the same scale.



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