Per-field land use and land cover data set of the Haean catchment, South Korea

Description of the data set

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1 Introduction

The data set contains land use and land cover (LULC) information for the Haean catchment (South Korea) for the years 2009, 2010 and 2011. The spatial data (UTM52N/WGS84, EPSG:32652) covers the whole study area in 2009 and 2010 and the northern half in 2011. The extent of the map is given by 38°19′45″N, 128°5′2″E (upper left corner) and 38°13′30″N, 128°11′10″E (lower right corner).

The data is a combination of ground census and non-accessible forest polygons (due to military restrictions) borrowed from pre-existing maps to supply a gap-filled map. The gap-filling information and other quality information are provided in the QA columns of the attribute table in the shape file. Further details are summarised in the legend file. A comprehensive description of the ground census and the methods used to produce the data set is given in Seo et al. (2014).

2 Data structure

2.1 LULC data

The zip archive `HaeanCover.zip` contains the LULC data in ESRI shapefile format with Quality Assurance (QA) and additional information. Following columns can be found in the attribute table:

1. LULC class columns (LULC2009, LULC2010, LULC2011)
   Land use/land cover classes (for details see `HaeanCover_Legend.xls`). Polygons covered with multiple types such as double-cropping fields have multiple entries per polygon in alphabetical order (e.g., bean, maize, ginseng).

2. Quality Assurance information (QA2009, QA2010, QA2011)
   The QA columns indicate general QA information.

Symbol in the column	Name	Description
null	Null	Data surveyed without any quality issue
?	Questionable	Either the field record has a quality issue (e.g., identification of crop type), the polygon was gap-filled or the crop type estimated or guessed based on pre-existing maps.
*	Unknown	It is not clear whether the polygon has a quality issue. This is mostly related to uncertain information on double cropping, management and mixed land use.
/	Not valid	Data was not collected or is invalid.

3. Management information (Mgmt2009, Mgmt2010, Mgmt2011)
   Recorded information on human intervention independent of the LULC type, classified into four classes corresponding to the Land Cover Classification System (FAO-LCCS) (Di Gregorio, 2005).

Symbol in the column	Description
managed	The polygon is explicitly managed by humans.
seminatural	The polygon is conceived as semi-natural (i.e. vegetation not planted by humans, but influenced by human actions)
natural	Natural land cover
non-vegetated	Non-vegetated area

4. Double cropping information (DblCrp2009, DblCrp2010, DblCrp2011)
   Qualitative information about the polygon purity during the growing season. DblCrp columns concern only temporal mixture of crops, primarily for dry field types.

Symbol in the column	Description
Yes	Multiple crops were cultivated successively.
No	A single crop type occupies the polygon during the whole growing season.
Unknown	Double cropping is possible, but was not confirmed by field observations.

5. Mixed land use information (Mixed2009, Mixed2010, Mixed2011)
   Qualitative information about the polygon purity during the whole year. Unlike the double cropping information, these columns concern both spatial and temporal mixtures.

Symbol in the column	Description
Yes	The polygon is a mixture of multiple LULC classes (spatial or temporal).
No	A single LULC type occupies the polygon for the whole year.
Unknown	Mixed LULC classes are possible, but were not confirmed by field observations. It occurs when double cropping related information was not perfectly recorded, dry field was in preparatory stage (thus crop type was unclear) or a lumped polygon was drawn with imperfect information (e.g., residential area).

6. Note (Note2009, Note2010, Note2011)
   Note on details (e.g., double cropping etc.)

2.2 Legend

The legend file `HaeanCover_Legend.xls` contains the legend of the LULC map. The class values of the shape file are linked with the corresponding land cover labels and extra information. The legend file has the

following columns:

Name	Description
Presence of Vegetation	Comparable to the FAO-LCCS initial level distinction
Edaphic Condition	Comparable to the FAO-LCCS second level distinction
Artificiality of Cover	Comparable to the FAO-LCCS third level of the dichotomous phase into eight major land cover types
Group	Land-use group information defined upon the local context
Super class	Super-class value was given in case that a specific type was not identified
LULC class	Recorded LULC class value
Common name	Common name of vegetation / non-crop type
Scientific name / Detailed information	Scientific name and other details
Life form	Life form of the vegetation cover according to the FAO-LCCS
Crop type	Crop type information comparable to the FAO-LCCS
Life cycle	Life cycle of the species and the local cultivation practice.

2.3   Reclassification and rasterisation

We provide a lookup table `HaeanCover_IGBP_lookup.xls` and a GNU R script `HaeanCover_reclassification_rasterisation.R` to convert HaeanCover to a land cover map consistent with the International Geosphere-Biosphere Programme (IGBP) Land cover system (Loveland et al., 2000).

Note that some of the perennial crops were reclassified as non-crop types (forest or shrub) to be consistent with the IGBP system (e.g., "Orchard" coded as "Open shrub") (U.S. Geological Survey, 2012).

For the rasterisation, we use the geometry engine `GEOS` (GEOS Development Team, 2014) through the package `rgeos` (Bivand and Rundel, 2014). The code was tested in GNU R v3.0.2 (R Core Team, 2013).

2.4   Preview

`HaeanCover_Preview.jpg` shows the preview of the LULC classes (2010) in the lon-lat Coordinate Reference System (CRS) with WGS 1984 datum (EPSG:4326). Additionally, we provide a Quantum GIS (QGIS) project `HaeanCover_Preview.qgs`.

3   License

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4   Acknowledgement

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