

Procedures we follow for Present day and Historical Land use map Construction for ORCHIDEE PFT map using George Hurtt Data set (GHD):

- 1) Firstly, number of PFTs planned are 19 for ORCHIDEE map, later we ultimately need to merge them into 13PFTs. (19 PFTs are: 1 Baresoil, 2-9 tree PFTs,10-11 c3,c4 natural grasslands, 12-13 c3,c4 annual crops,14-15 anthropogenic grassland, 16-17 c3,c4 perennial crops, 18 c3 nfix, 19 urban). Resolution planned 0.25x0.25 as that of GHD.
- 2) For present-day map, we mainly impose anthropogenic area (c3, c4 annual and perennial crops,c3-nfix crop, urban, pasture) from GHD and then only reduce or expand forests and natural grassland proportionally.
- 3) Natural vegetation is derived from the observed present-day ESA ECLC map.
- 4) For backward construction (we plan to do it from 2015-1500, GHD data is available until 850): we use the simplified year to year transitions from GHD (See Table 1 below for complete Matrix of transitions):

The transitions we use are:

- i) from primForest+SecForest (Trees) to crops, pasture and urban
- ii) from primNonForest+SecNonForest to crops, pasture and urban
- iii) from crops,pasture and urban to SecForest
- iv) from crops to pasture
- v) from crops to urban
- vi) from pasture to crops
- vii) from urban to crops
- viii) from urban to pasture
- ix) from pasture to urban

5) From the above simplified transitions, year to year changes are imposed on the present day map and construct the backward map.

6) If no information is available on the natural distribution of vegetation at a specific location then search for nearest (within ~5x5) point that has natural vegetation and introduce that vegetation.

7) Throughout construction we keep the baresoil area unchanged, unless otherwise if the anthropogenic area is larger than the natural part of the grid cell, then encroach the baresoil.

Note:

- 1) In GHD c4 perennial crops includes sugarcane, c3 perennial crops includes banana, berry, citrus, fruit-trees, grapes, palm, and other tropical evergreens. This helps us to merge the c3, c4 perennial crops into ORCHIDEE PFTs class
- 2) Rangeland from GHD, included into natural grassland
- 3) Pasture from GHD, treated as anthropogenic grassland

Table 1: Simplified transitions from GHD data transitions

Transitions 9x8=72-9= 63		1	2	3	4	5	6	7	8
		secdn	c3ann	c4ann	c3per	c4per	c3nfx	pastr	urban
1	primf+ secdf								
2	primn+ secdn+ range								
3	c3ann								
4	c4ann								
5	c3per								
6	c4per								
7	c3nfx								
8	pastr								
9	urban								

Note: Except yellow boxes, the other white boxes represents transitions. Yellow boxes are not accounted.