Potential Natural Vegetation

Metadata and Technical Documentation

Abstract:

We derive a global map of natural vegetation at a 5 min resolution classified into 15 vegetation types (Plate 2). This data set is derived mainly from the DISCover land cover data set, with the regions dominated by land use filled using the vegetation data set of Haxeltine and Prentice. Thus our natural vegetation data set is consistently derived from the same source, the DISCover data, as our croplands data set. This data set does not necessarily represent the world's natural pre-agricultural vegetation. Rather, it is representative of the world's "potential" vegetation (i.e., vegetation that would most likely exist now in the absence of human activities). In regions not dominated by human land use, our vegetation types are those currently observed from a satellite. This differs from pre-settlement natural vegetation to the extent that vegetation types have changed because of changing environmental conditions such as climate and CO2 concentrations

Citation:

Ramankutty, N., and J.A. Foley (1999). Estimating historical changes in global land cover: croplands from 1700 to 1992. Global Biogeochemical Cycles 13(4), 997-1027.

Use Agreement:

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Data Products:

The following data products are included:

- Potential Natural Vegetation
  - 15 natural vegetation categories
    - 1: Tropical Evergreen Forest
    - 2: Tropical Deciduous Forest
    - 3: Temperate BL Evergreen Forest
    - 4: Temperate NL Evergreen Forest
    - 5: Temperate Deciduous Forest
    - 6: Boreal Evergreen Forest
    - 7: Boreal Deciduous Forest
    - 8: Evergreen/Deciduous Mix Forest
    - 9: Savanna
    - 10: Grassland/Steppe
    - 11: Dense Shrubland
    - 12: Open Shrubland
    - 13: Tundra
    - 14: Desert
    - 15: Polar/Rock/Ice

Formats:

All data are provided in the following formats:

- .tif : Geotiff (More information: http://trac.osgeo.org/geotiff/)
- .nc : NetCDF (More information: http://www.unidata.ucar.edu/software/netcdf/)
- .asc : ARC/INFO ASCII GRID (More information: http://en.wikipedia.org/wiki/Esri_grid)
- .kmz : Google Earth (Download Google Earth free: http://www.google.com/earth/index.html)

Resolution:

- Spatial: Five minute by five minute resolution (~10km x 10km at equator)

Map Projection:

- Data presented as five-arc-minute, 4320 x 2160 cell grid
- Spatial Reference: GCS_WGS_1984
- Datum: D_WGS_1984
- Cell size: 0.083333 degrees
- Layer extent:
  - Top : 90
  - Left: -180
  - Right: 180

- Bottom: -90

Methods: *From Ramankutty and Foley 1999*

To derive this potential vegetation data set, we use the 1km resolution DISCover data classified under the Olson Global Ecosystems (OGE) framework. Of the 94 OGE classes, 19 denote some degree of land use, and 12 denote some type of wetlands or land-water fringe. We first reclassify the 94 OGE classes into 15 potential vegetation types and 3 additional classes, land use, wetlands, and water. Because wetlands are still poorly characterized in the DISCover data, we decided to ignore them and consider only upland natural vegetation. Within each 5 min resolution grid cell, we search among the 1km pixels for the dominant potential upland vegetation class (ignoring the land use, wetlands, and water classes) and assign that to be the potential vegetation for that 5 min grid cell (we also use the two classes denoting 100% water to create a land-water mask at 5 min resolution). Even in regions with substantial land use, there is often some remnant natural vegetation at 1km resolution that helps us identify the potential vegetation type. In some grid cells, two types share the dominant potential vegetation class, or no potential vegetation class exists. In such cases, we iteratively extend the search to include adjacent 1km pixels, until we find a dominant potential vegetation class within a slightly expanded grid cell. This procedure gives us a preliminary map of the dominant potential upland vegetation at 5 min resolution. However, this preliminary data set has several problems in the regions dominated by land use; often the remnant vegetation is not representative of the potential vegetation, and furthermore, extrapolations from pixels that are far away yield wrong results. Thus we further refine this data set by using the HP data to fill in the regions dominated by land use. (*continued on pp6 of Ramankutty and Foley 1999).*