

## Why produce a global map of terrestrial carbon stocks?

The UN Framework Convention on Climate Change is currently discussing incentives for Reducing Emissions from Deforestation and forest Degradation in developing countries (REDD). Emissions from land use change, mainly forest loss, contribute to about 17.4% of total anthropogenic greenhouse gas emissions (IPCC 2007).

A global map of terrestrial carbon stocks is useful for providing a globally consistent picture of carbon storage to show how carbon stocks vary across the world, providing an illustration which may be helpful in discussions on REDD and Land Use, Land Use Change and Forestry (LULUCF). The global map can be combined with other datasets in spatial analyses to illustrate how variation in carbon stocks relates to other values, high biodiversity value or ecosystem services and factors such as human population density, at global or regional scale. It can also serve as a frame of reference national scale analyses to support decision-making in relation to REDD.

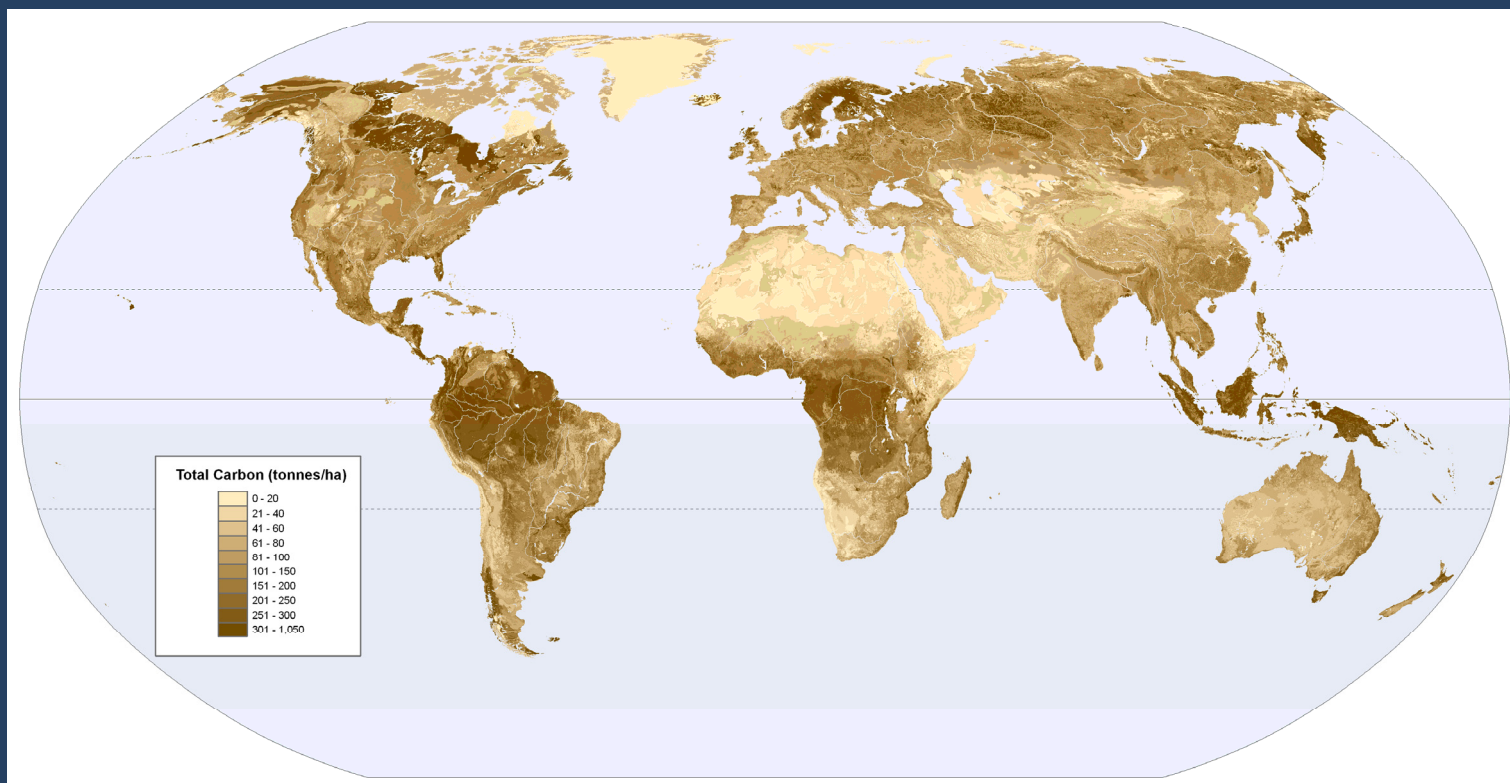
## Data and methods

UNEP-WCMC has been working to upgrade the global map of carbon stocks used in its original publication *Carbon and biodiversity: a demonstration atlas* (Kapos *et al.* 2008). The greatest need has been to improve upon the rather coarse data on soil carbon included in the original map.

The Harmonized World Soil Database (HWSD) version 1.1 (FAO/IIASA/ISRIC/ISS-CAS/JRC 2009) was used to generate an improved global map of soil organic carbon values to 1m depth at a nominal spatial resolution of 1km\* (Scharlemann *et al.* 2009).

This new soil carbon map has been combined with the biomass carbon map developed by Ruesch & Gibbs (2008) using IPCC Tier 1 methodology and GLC2000 land cover data to provide a new global map of terrestrial carbon stocks.

## Updated global map of terrestrial carbon stocks



## Conclusions and outlook

The updated global carbon map improves upon the rather coarse data on soil carbon (IGBP-DIS 2000) that were used in UNEP-WCMC's *Carbon and biodiversity: a demonstration atlas* (Kapos *et al.* 2008). It therefore provides a better tool for visualising the distribution of carbon stocks, which are dominated by soil stocks in some parts of the world such as boreal peatlands and tropical swamps. Further improvements could be achieved by incorporating updated biomass carbon estimates derived from 2005 land cover data (currently under review in draft form) and potentially by considering the likely effects of land use change on soil carbon stocks.

\*A global map of estimated soil carbon stocks to 1m depth was generated based on the soil organic carbon and bulk density values included in the HWSD (FAO/IIASA/ISRIC/ISS-CAS/JRC 2009), adjusting for gravel content and taking account of variations in soil depth. The data in the HWSD were quality checked, incorrect values were adjusted and missing data filled in where possible. Many of these data are based on the FAO 1974 soil mapping units, which are much larger polygons that have been rasterised at 1km resolution. These estimates reflect inherent soil properties at the time of the original survey, but do not take account of land use change.

## References:

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## Affiliations:

<sup>1</sup> UNEP World Conservation Monitoring Centre  
219 Huntingdon Road, Cambridge CB3 0DL, UK.  
<sup>2</sup> European Commission - Joint Research Centre (JRC)  
SDME 10/78, 1049 Brussels, Belgium.

## Contacts:

Climate Change and Biodiversity Programme  
UNEP World Conservation Monitoring Centre  
219 Huntingdon Road, Cambridge, UK. CB3 0DL  
Tel: +44 (0)1223 814636, Fax: +44 (0) 1223 277136  
E-mail: [barney.dickson@unep-wcmc.org](mailto:barney.dickson@unep-wcmc.org)  
Website: <http://www.unep-wcmc.org/climate>