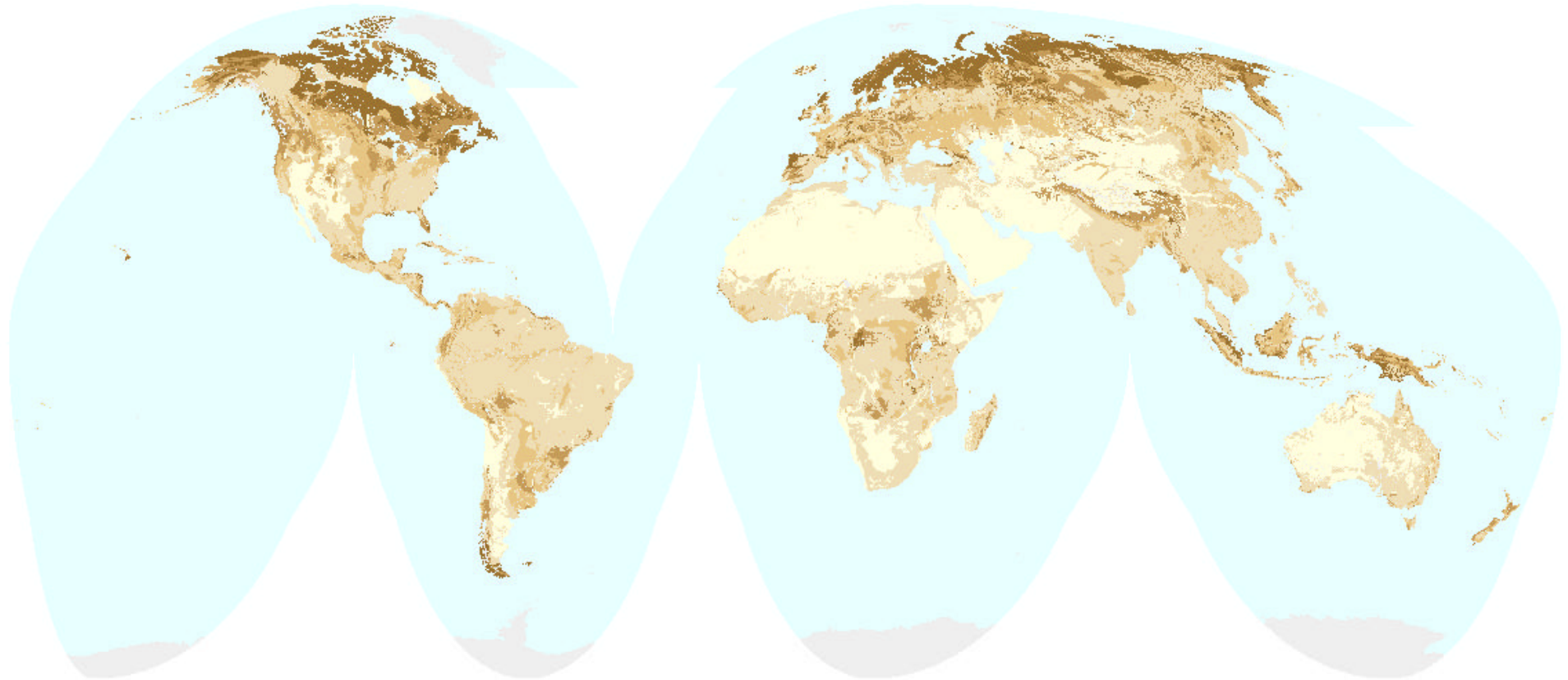


Global Carbon Storage in Soils



Map Projection: Interrupted Goode's Homolosine

Citation: World Resources Institute - PAGE, 2000

Notes:

Carbon storage values in the boreal region reach a maximum of 1,250 metric tons of carbon per hectare. Carbon storage values greater than 1,000 metric tons of carbon per hectare account for 2 percent of the area falling in the greater than 300 metric tons per hectare class. Carbon storage values are not shown for Greenland and Antarctica, where limited data were available.

Carbon storage
(metric tons / ha)

1 - 50

51 - 100

101 - 150

151 - 300

> 300

no data

Map Description:

Organic carbon is stored in soils in the form of dead plant matter and microorganisms. WRI has developed an estimate of the spatial distribution of global carbon stores in the soils of terrestrial ecosystems (forests, grasslands, agroecosystems, and other). This map shows the distribution of carbon storage in the world's soils. The data on which the map is based (ISRIC-WISE dataset) provide estimates of carbon storage values as a low-to-high range, in metric tons of carbon per hectare; the map depicts storage values at the high end of the range. The map shows that the greatest soil carbon stores are found in the high latitudes (boreal forests and tundra), with other important stores located in tropical forests, tropical savannas, and temperate grasslands.

Analytical Overview:

WRI's estimates of carbon stores in soils are based on those of Batjes (Batjes, 1996), who estimated the global stock of organic carbon in the upper 100 cm of the soil to be between 1,462 and 1,548 billion tons of carbon. The higher value corresponds to "stone-free" soil conditions. Batjes first analyzed over 4,000 individual soil profiles contained in the World Inventory of Soil Emission Potentials (WISE) database compiled by the International Soil Reference and Information Centre (ISRIC) (Batjes and Bridges, 1994). Batjes then used the soil profile data to compute the average soil organic carbon (SOC) at several depth intervals for each of the world's soil types as defined by the United Nations Food and Agriculture Organization (FAO). The global estimate was produced by summing the SOC content of the soil types found in each of the 30x30 minute grid of the digitized FAO-UNESCO Soil Map of the World (FAO 1991), weighting the SOC values according to the shares of soil type area within each grid cell. WRI repeated the Batjes analysis using a more recent 5x5 minute grid of the Soil Map of the World (FAO, 1995), together with average SOC content values taken from Batjes (Batjes, 1996 and 2000). This approach yielded an estimate of global organic soil carbon of 1,555 billion tons in the upper 100 cm of soil. WRI did not adjust for stone content, so our estimate corresponds to Batjes' estimate of 1,548 billion tons.

Source:

1. Food and Agriculture Organization of the United Nations (FAO). 1995, Digital Soil Map of the World (DSMW) and Derived Soil Properties. Version 3.5. CD-ROM.
2. Batjes, N.H. 1996. "Total Carbon and Nitrogen in the Soils of the World". *European Journal of Soil Science* 47: 151-163.