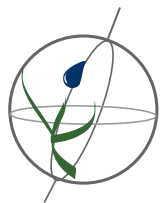


## Map Description

Forests contribute in a number of ways to maintaining local and downstream environmental conditions. They physically stabilize the upper reaches of watersheds where rainfall is heavy and land steeply sloped and prone to earth movements. Tree roots “pump” water, thereby reducing soil moisture content and the likelihood of mud slides, while root structures increase the shear-strength of soil and help prevent landslides. Forests and other vegetation are also crucial in moderating water flows by soaking up precipitation and releasing it in a controlled, regular supply. For example they reduce runoff during high-water periods and maintain flow during dry periods. Deforestation, for instance, can cause the relatively steady, year-round water flows in downstream areas to change to destructive flood and drought regimes (Matthews et al. 2000). In addition, forests provide habitat for many terrestrial species. In many floodplain areas, forests also provide much of the food and breeding grounds on which fish and other species depend.

Forests have historically been the preferred land use for drinking water supply catchment areas. Water is filtered and purified to some extent by its passage through foliage and forest soils. Perhaps more importantly, forested land is relatively free of water pollutants associated with livestock rearing, agriculture, or industrial activity. The value of forests in maintaining high-quality drinking water supplies is well documented. For example, in the United States, National Forests are the largest single provider of water in the country: over 60 million people in 3,400 communities rely on these forests for their drinking water.



In contrast to some other of nature's services the value of water quality protection is relatively easy to monetize, being calculated as the avoided cost of water filtration plants. The value of U.S. watershed forests in this regard has been estimated at \$3.7 billion per year (Dombeck, 1999).

This map shows the percentage of each watershed that is covered by forests. The most forested basins are the Amazon and Orinoco basins in South America, the Congo and Ogooué in Central Africa, basins in Papua New Guinea and Kalimantan, Indonesia, basins in Southeast Asia, and basins in northern latitudes with low population densities, such as the Yukon and Mackenzie basins in North America, the Lena and Pechora in Russia, or the North Dvina in Europe.

Of the watersheds analyzed, 42 have lost more than 75 percent of their original forest cover — the closed forests that are believed to have existed in the pre-agricultural era. Fifteen of these have lost more than 95 percent of their original forest cover. Most of these basins, with the exception of the Tigris and the Euphrates, are found in Africa, Central America, and Europe. Large basins, with very extensive forest cover, have lost a relatively small fraction of their original forest, but the absolute losses are large. Nine basins, including the Amazon, Ganges, Mekong, Mississippi, Paraná, and Volga river basins, have lost more than 500,000 km<sup>2</sup>. The Yangtze and the Congo basins have each lost more than 1 million km<sup>2</sup> of forest (Revenga et al., 1998).

### Mapping Details

The USGS Global Land Cover Characterization Database (GLCCD 1998) with the International Geosphere Biosphere Programme (IGBP) classification was used to identify the extent of different land cover types within each basin. The land cover database is derived from 1-kilometer resolution satellite imagery spanning April 1992 through March 1993. These data are most useful for analyzing general land cover patterns at a continental or large scale; with smaller watersheds the data are less reliable. Percent forest indicates the percentage of the basin classified as evergreen needleleaf forest, evergreen broadleaf forest, deciduous needleleaf forest, deciduous broadleaf forest, and mixed forest. Percentage forest area was aggregated by large river basins to create the global map.

### Map Projection

Robinson

### Sources

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