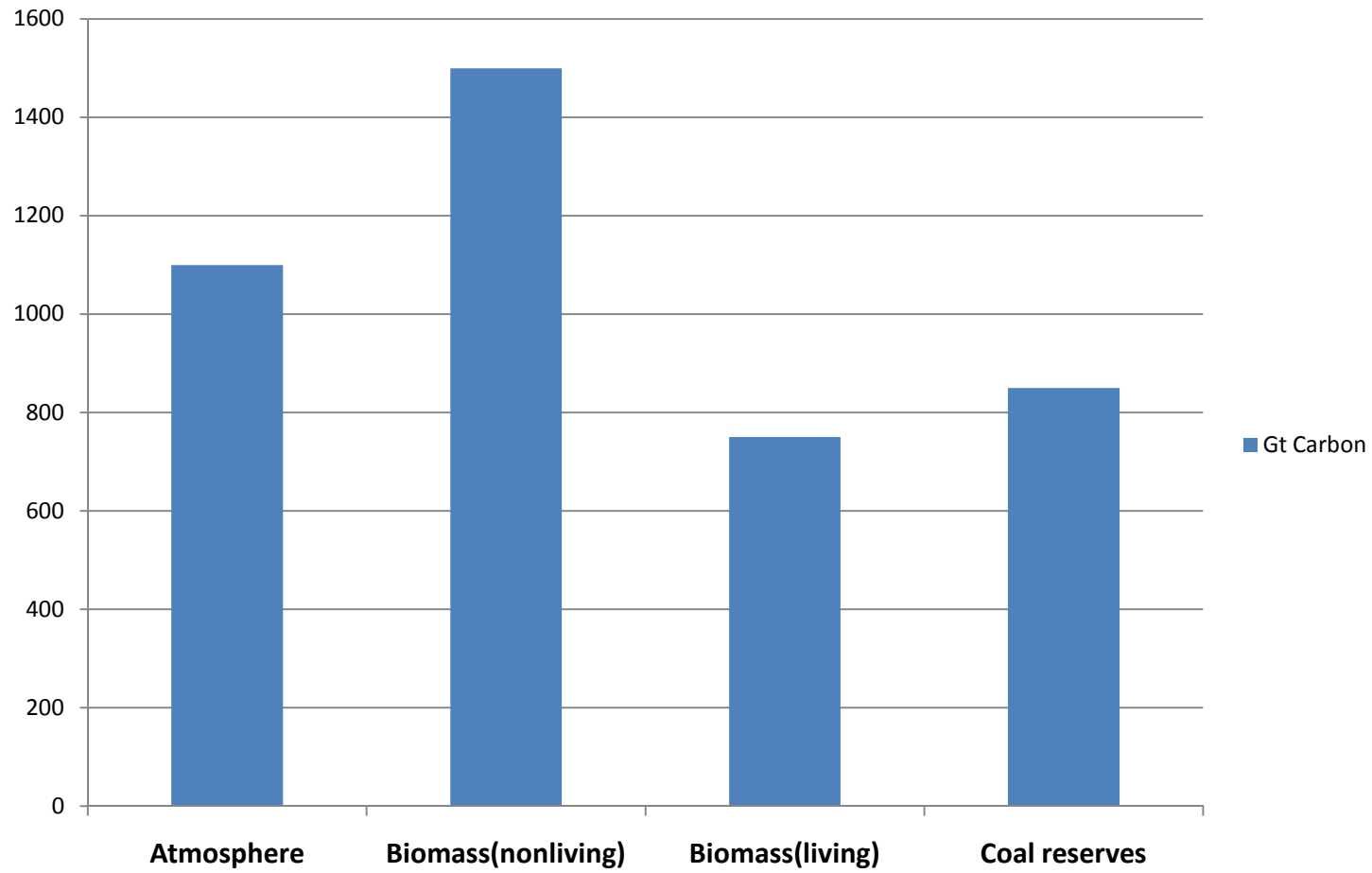




Carbon and the Biosphere

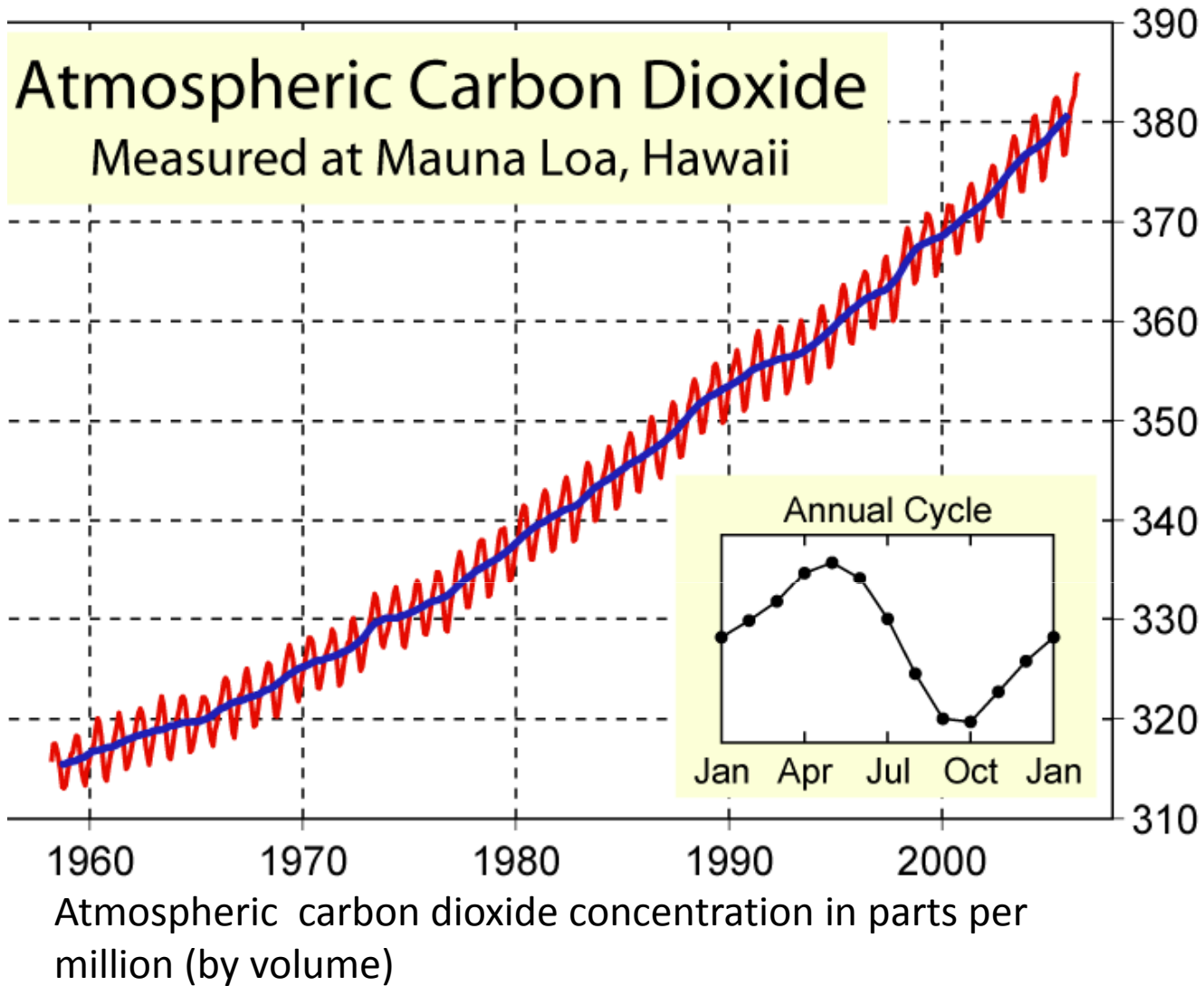


Mass carbon (in Gt)

Sources: US Energy Information Administration; <http://cdiac.ornl.gov/epubs/ndp/ndp017/ndp017.html> (US Carbon Dioxide Information and Analysis Center, Department of Energy); <http://www.esd.ornl.gov/projects/gen/carbon2.html> (Jonathon Adams, Oak Ridge National Laboratory)

How much carbon?

- 10^8 Gt; total mass of carbon in Earth's crust.
- 10^3 - 10^4 Gt; carbon stored in the atmosphere, in biomass, and in various non-oxidized forms within the Earth's crust (i.e., fossil fuels).



Carbon sources/sinks: human impact

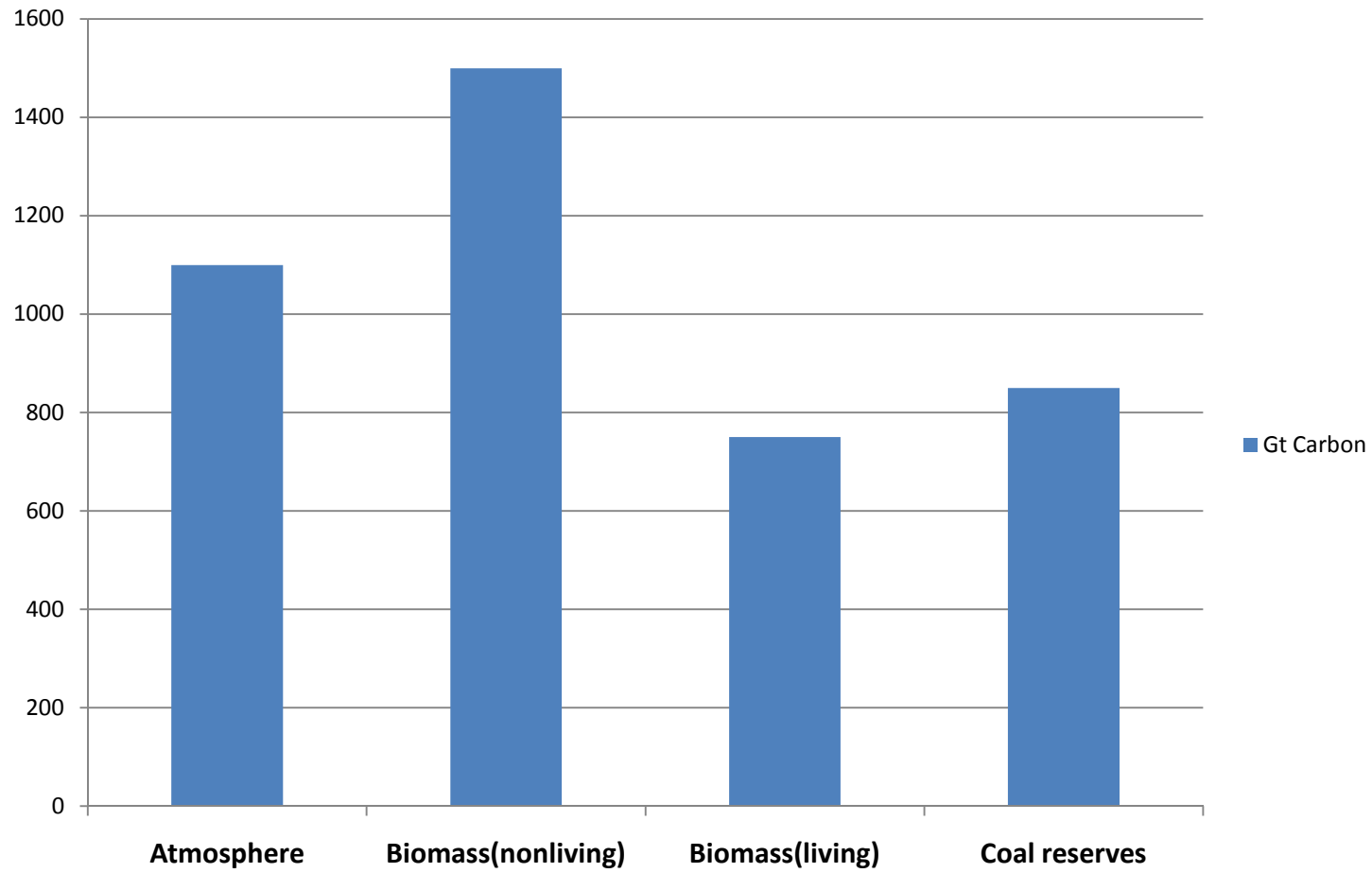
Anthropogenic emissions

- Fossil fuels combustion; cement production: 7 Gt/year
- Changing land use: 1.5 Gt/year

Mitigated by...

- Land sinks: -2.6 Gt/year
- Dissolved into ocean: -2.3 Gt/year

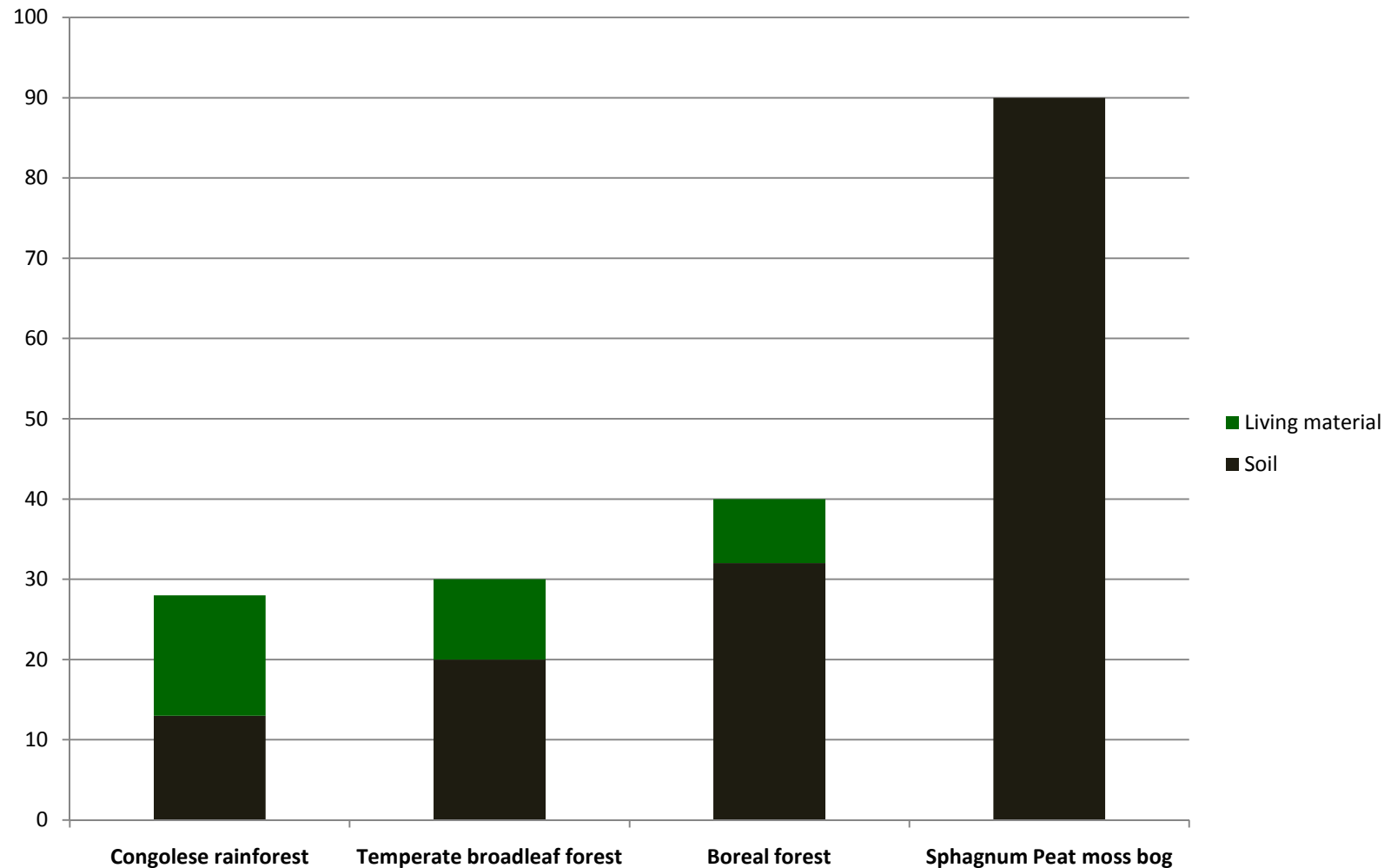
Yearly addition to atmosphere: 3.5 Gt



Mass carbon (in Gt)

Sources: US Energy Information Administration; <http://cdiac.ornl.gov/epubs/ndp/ndp017/ndp017.html> (US Carbon Dioxide Information and Analysis Center, Department of Energy); <http://www.esd.ornl.gov/projects/gen/carbon2.html> (Jonathon Adams, Oak Ridge National Laboratory)

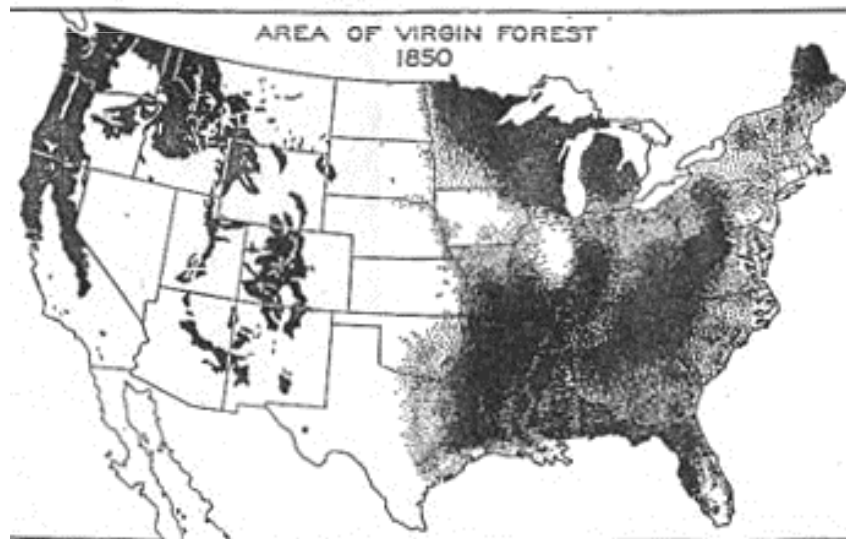
Land ecosystems: carbon reservoirs



Carbon per square meter for a 300,000 square kilometer region of the rainforest in the Congo; globally-averaged temperate forests; averaged boreal forests; and a peat bog in Glensaugh, near Aberdeen, Scotland.

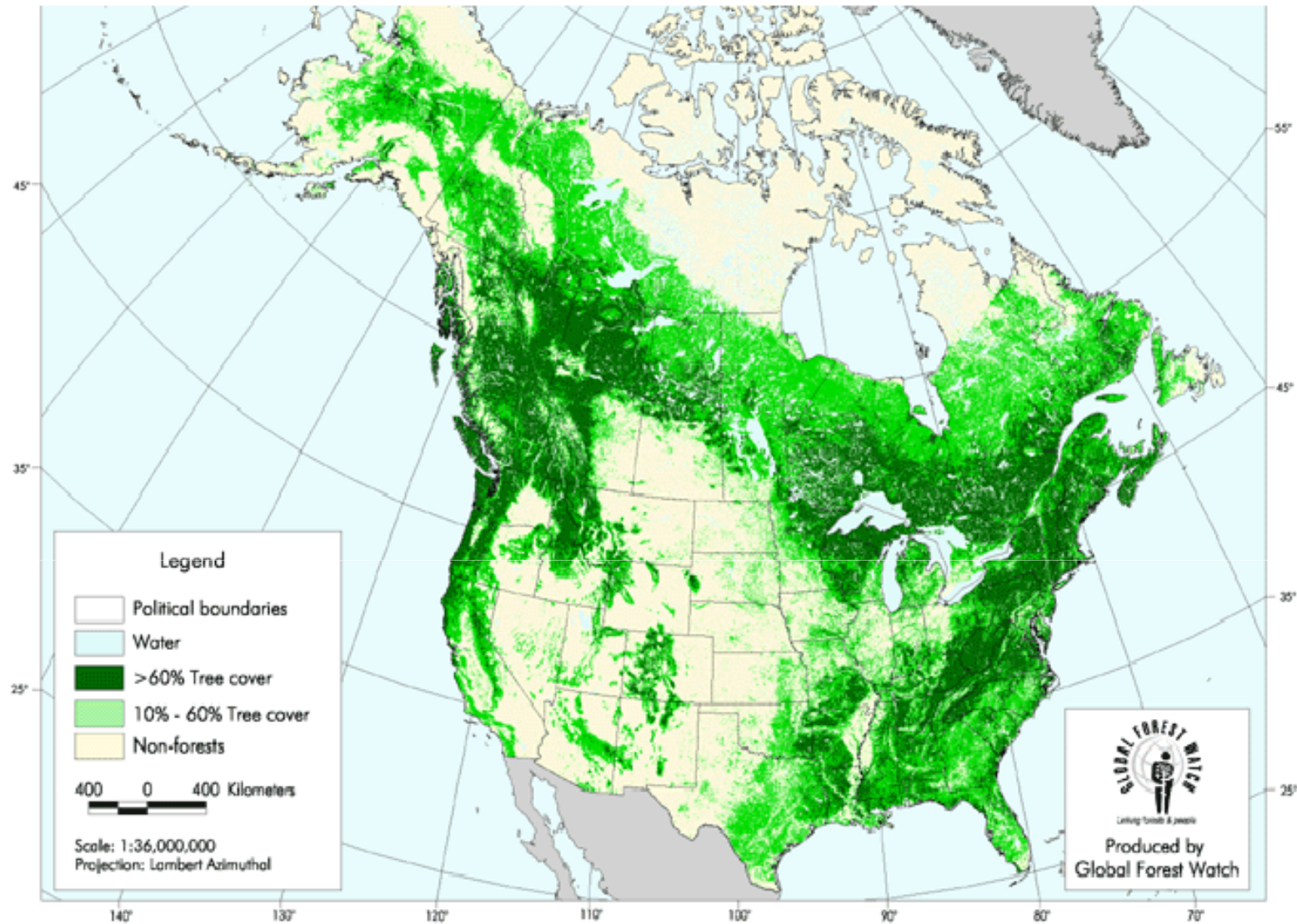
Land subsidence in the San Joaquin River delta





Coverage of old-growth forest in the United States, 17th century to present day.

Source: wikipedia.org



Current forest coverage in North America.
 Regrowth of forests in temperate regions sequesters 200 Mt of carbon per year.