Rates of carbon storage by mangroves are substantially higher than previously thought, research suggests. Using new data, researchers have estimated that worldwide, mangroves bury 26.1 megatonnes of organic carbon per year, which is 42% more than the estimations made in 2008.

Mangroves provide both climate change mitigation and adaptation services. Mangrove wetlands provide important habitat for aquatic and terrestrial wildlife. Their protection and restoration can also play a valuable role in climate change adaptation and mitigation: they prevent erosion in the face of sea level rises and store carbon in their sediments.

In recent years, the value of mangrove wetlands as carbon sinks has become increasingly recognised and more research has been conducted in this area. Since 2003, the amount of available data on organic carbon in mangrove soils has more than doubled, but this has not been synthesised in a review. This study recalculated the amount of carbon stored per year, over the last 100 years (the burial rate), using the newly available data for mangroves worldwide.

Since 2003, data on organic carbon in mangrove wetlands was available for many more countries than previously, including Brazil, Colombia, Malaysia, Indonesia, China, Japan, Vietnam and Thailand. The figures for organic burial rates ranged from 22 g per m² per year in Japan, to 1020 g per m² per year in China. Figures at a local level were sometimes similarly varied, for example, rates in a single wetland in Australia ranged from 26 to 336 g per m² per year.

Considering all the relevant data, the researchers calculated an average burial rate of 163.3 g of organic carbon per m² per year. Mapping this to the total area of mangrove wetlands worldwide produces a global burial rate of 26.1 megatonnes per year, which is a 42% increase from previous estimates.

The results indicate that mangrove wetlands are storing more organic carbon than previously recognised and represent an important carbon sink. This has implications for the quantities of carbon that stand to be reintroduced to the atmosphere in the event of destruction of mangrove wetlands or degradation of their soils.

If mangroves are not given suitable protection to ensure their health and resilience in the face of climate change, a vicious circle could arise, whereby rising sea levels and increased storm frequency will stress and damage mangrove wetlands. This will then affect their capacity to store organic carbon and the delivery of this ecosystem service will be jeopardised. If the carbon is released into the atmosphere as CO₂, this will exacerbate climate change further, which will have even greater impacts on this important ecosystem service.

Although data collection has improved, there is clearly a large variation in the amount of carbon stored in mangrove wetlands. Further work is needed to understand the local implications of this better, and to ensure that this valuable ecosystem service is maintained.