from drained peatlands globally; in comparison the burning of fossil fuels releases 21.3 Pg year^{-1} of CO_2. The global CO_2 emissions from drained peatlands have increased from 1.1 Pg in 1990 to 1.3 Pg in 2008 (>20% increase). This estimate excludes emissions from peat fires. Total CO_2 emissions from the worldwide 500,000 km^2 of degraded peatland may now exceed 2.0 Pg (including emissions from peat fires) which is almost 8% of all global fossil fuel emissions from 0.2% of the global land area, one of the most concentrated land-use related CO_2 emissions in the world.

Other impacts

- Water regulation;
- Wildlife risk;
- Subsidence;
- Socio-economics.

About us

TROPIC is a university-based tropical peatland research and consultancy team that can provide a host of worldwide services (including site assessment, and management and remediation advice). Sue Page and Kevin Tansey have established a thriving research programme, and are highly experienced. With an already excellent track record of research and consultancy work, we can provide for your tropical peatland needs. If you are interested in discussing how we can help, then please contact us.

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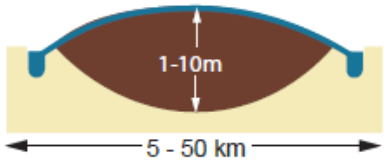
Peatland drainage

Peatlands are globally important carbon (C) stores. They comprise a large accumulation of terrestrial organic matter, fixed from the atmosphere by photosynthesis; and contain up to one third of the world's terrestrial C pool (i.e., soil and vegetation). When drained for agriculture, stored C is released to the atmosphere as carbon dioxide (CO_2). Globally, peatland drainage is responsible for 5% of human-derived CO_2 emissions; drainage also increases the risk of fire, with associated environmental and socio-economic costs, and of flooding, through the process of (peat)land subsidence.

Large areas of peatland across the world are currently drained for agriculture, forestry, and, to a lesser extent, peat extraction. Unless responsibly managed, drainage, conversion to agricultural land and fertilisation of peat soils can turn peatlands into strong sources of greenhouse gases (GHGs) and, ultimately, into landscapes that are very difficult to manage owing to land surface lowering and an increased risk of flooding. Agriculture, forestry and peat extraction have so far impacted about 25% of the peatlands on Earth.

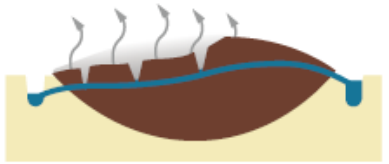
Carbon Implications

As a result of peat drainage, the organic C—which has built up in the peat deposit over thousands of years and is normally under water—is suddenly exposed to oxic (oxygenated) conditions. It decomposes (aerobically) and turns into CO_2, which is released into the atmosphere. Undamaged peatlands are usually net accumulators of C. In damaged peatlands, this role may be reversed. Peatland plant productivity may decline, so that less atmospheric CO_2 is sequestered, and rates of litter and peat decomposition may increase because of a thickening or deepening of the oxic zone caused by lowering of the water table. Oxic decomposition rates are many times – up to orders of magnitude – greater than those in the absence of oxygen (anoxic conditions). Therefore, a deepening of the oxic zone can cause increases in the rates of CO_2 emission from a peatland and a loss of C sink function. It is estimated that ~1 Pg $year^{-1}$ of CO_2 is emitted currently

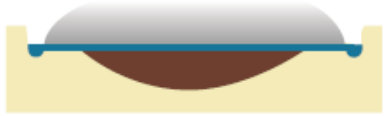


Natural situation:
- Water table close to surface
- Peat accumulation from vegetation over thousands of years

Drainage:
- Water tables lowered
- Peat surface subsidence and CO_2 emission starts



Continued drainage:
- Decomposition of dry peat: CO_2 emission
- High fire risk in dry peat: CO_2 emission
- Peat surface subsidence due to decomposition and shrinkage



End stage:
- Most peat carbon above drainage limit released to the atmosphere within decades.
- unless conservation/mitigation measures are taken.