Measuring subsidence

Detected from surface elevation change

Daniel Murdiyarso, Kristell Hergoualc'h, Sigit Sasmito and Bayu Hanggara

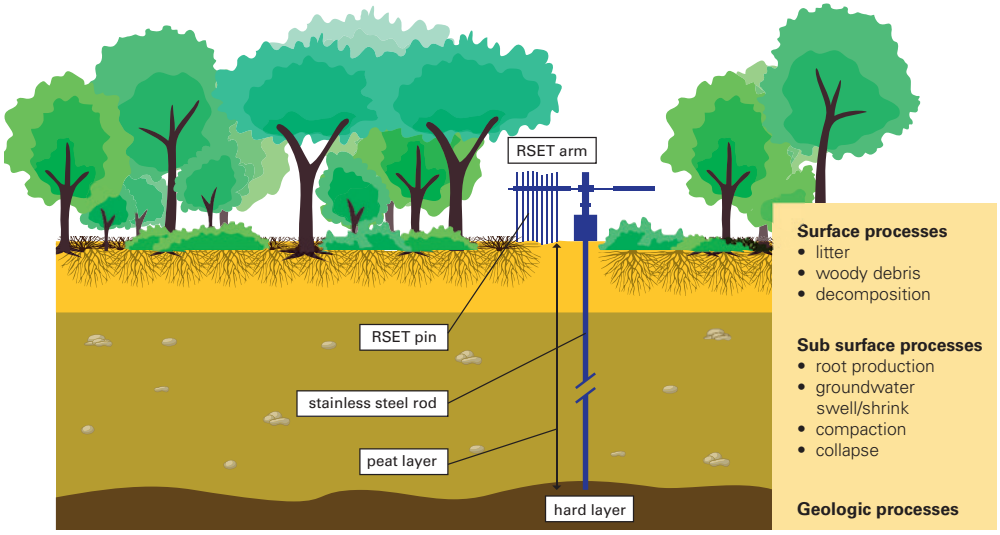
Why do we monitor subsidence?

Depending on the way peatlands are managed, peat surface elevation changes as a result of deforestation, drainage and subsequent fires. The surface can also rise when revegetated and/or re-wetted.

CIFOR
Global Landscapes Forum

How do we measure it?

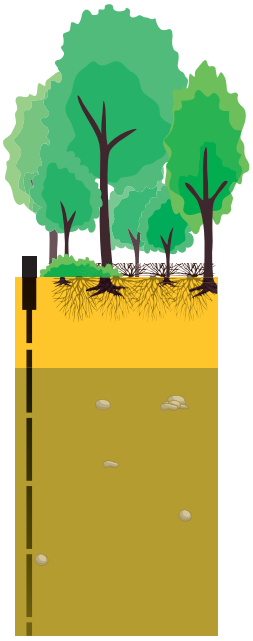
A Rod Surface Elevation Table (RSET) is commonly used to monitor surface elevation change in coastal wetlands. The RSET measurements can be used to determine how to maintain the water table.



The RSET is a tool that consists of several sections of stainless steel, which are hammered down one by one to reach the hard layer beneath the surface. This will ensure that any change we measure is due to surface elevation change rather than geologic processes.

The measurements of contemporary surface elevation change are conducted every 6 months.

Past accumulation of sediments and burial of carbon is detected using the radio nucleide method ^{210}Pb combined with spectrometer.



Facts and figures

- Coastal wetlands are more studied ecosystems than peatlands due to the pressing challenges of sea-level rise.
- Peatland subsidence is part of a process of peat degradation due to drainage and fires causing GHG emissions.
- Depending on the water regime and the vegetation introduced, subsidence can range from 2 to 5 cm yr^{-1}.
- A minimum subsidence of 2 cm yr^{-1} could cause CO_2 emissions of 27 Mg ha^{-1} yr^{-1}.
- Monitoring of topical peatland subsidence is very limited. More stations are needed.

References

Cahoon DR et al. 2002. *Journal of Sediment Research*. 72:734–739. doi:10.1306/020702720734

Webb et al. 2013. *Nature Climate Change*. 3: 458-465 doi:10.1038/nclimate1756

Woosten et al. 1997. *Geoderma* 78: 25-36.

Photos by Deanna Ramsay/CIFOR, James Maiden/CIFOR and Daniel Murdiyarso/CIFOR

RESEARCH PROGRAM ON Forests, Trees and Agroforestry CGIAR Fund USAID FROM THE AMERICAN PEOPLE Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety UNEP THE WORLD BANK

cifor.org/swamp | blog.cifor.org

Updated May 2017