

# New methods to quantify land subsidence due to peat compaction (Cumberland Marshes, Canada)

*S. van Asselen\* and E. Stouthamer*

## Abstract

Compaction and oxidation of peat leads to land subsidence. This has important implications for groundwater management, may lead to an increased flooding risk (due to an increase in cross-valley gradients and changes in the architecture of natural levees) and damage to buildings and roads. Furthermore, peat compaction has important implications for delta evolution, as it may influence the occurrence of avulsion (the partial or full abandonment of a river channel in favor of a new course). To determine effects of peat compaction in lowland deltaic settings, field work has been carried out in the Cumberland Marshes (Canada), an area with a natural landscape comparable to the Middle Holocene western Netherlands. On this poster, new methods to quantify the amount of subsidence due to compaction are presented.

## Peat growth in lowland deltaic environments

### PEAT COMPACTION & OXIDATION

### LAND SUBSIDENCE

### Avulsion

Increased flooding risk

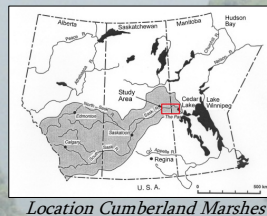
Implications for groundwater management

Damage to construction works

### Delta evolution

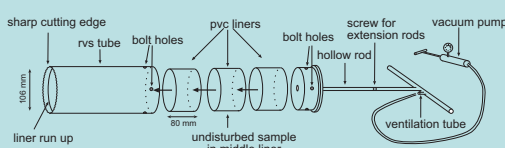
### FIELD STUDY

**Aim:** define relations between the amount of compaction, type and thickness of overlying sediment, peat type and distance to active rivers.



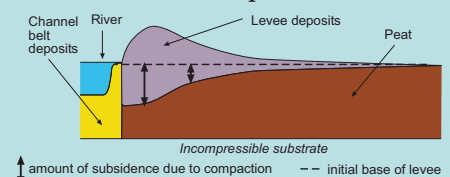
## METHOD 1

Compare the bulk density of uncompacted peat and compacted peat to determine the volume reduction due to compaction.



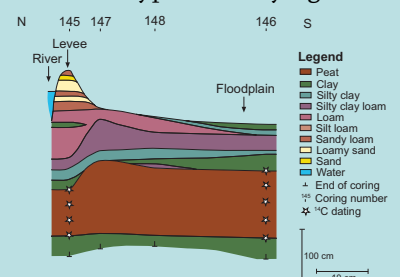
## METHOD 2

Use detailed lithostratigraphic cross-sections to determine the amount of subsidence due to compaction.



## Preliminary results

The amount of compaction depends on peat type, organic matter content, depth, thickness and type of overlying sediments.



**Universiteit Utrecht**

\*Corresponding author: [s.vanasselen@geo.uu.nl](mailto:s.vanasselen@geo.uu.nl). Department of Physical Geography, Faculty of Geosciences, Utrecht University, P.O. Box 80.115, 3508 TC Utrecht, The Netherlands. Tel.: +31(0)30 2532779. Website: [www.geo.uu.nl/fg/palaeogeography](http://www.geo.uu.nl/fg/palaeogeography).