

Project

HSOV1a |

Climate effects on decomposition in drained peat meadows: implications for peat subsidence and water quality

Description of research

This research project aims at quantifying the effects of climate change (temperature increase, long wet and dry periods, increasing salinity of soil pore water) on the rates of decomposition and mineralization of peat in the drained peat meadows used for agriculture in The Netherlands. The consequences of these effects for soil subsidence and nutrient release from peat soils will also be indicated. Decomposition rates of peats at different soil depths are being measured under controlled conditions (temperature, water chemistry, soil moisture, aerobic as well as anaerobic conditions).

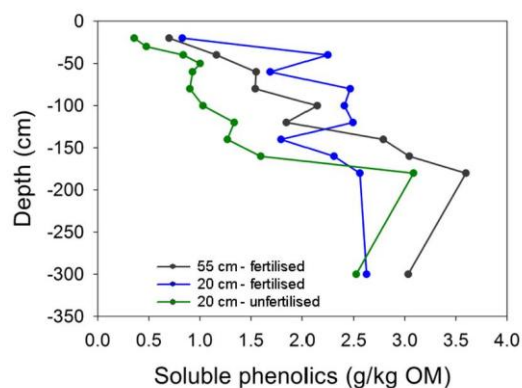
Research question

What is the influence of climate change on decomposition of organic material in drained peat areas?



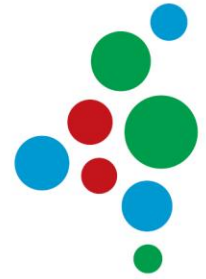
The most important conclusions

- We revealed that the content of soluble phenolics in peat soils declines going from deeper, undrained layers towards the superficial layers, where the availability of oxygen has led to their decay. This is relevant in the context of peat subsidence, because the phenolics have been shown to strongly inhibit the decomposition of peat. Once the phenolics have disappeared, the organic material as a whole starts to decompose rapidly and the peat subsides
- Increased concentrations of salts leads to ammonium accumulation in undrained Sphagnum peat. Ammonium can stimulate the growth of grasses and thereby changing the composition of the vegetation.



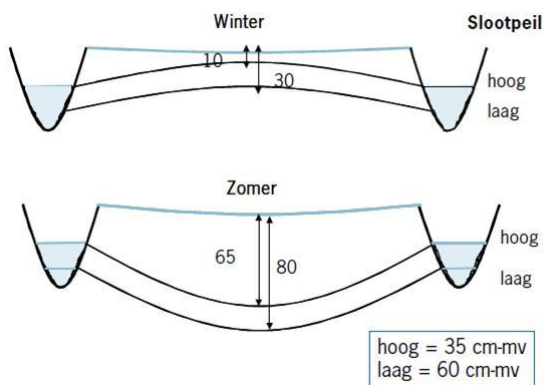
Kennis voor Klimaat

Knowledge for Climate



Possible applications from the project

- As quantifying the effects of dry summers on decomposition and mineralisation is one of the aims of the project, water management could be adapted to the results of the project.
- The workshops organised by HSOV1c, the Institute for Environmental Studies (IVM, VU Amsterdam), improves interaction with local stakeholders. During these workshops local problems are discussed and solutions are explored. This information gives input for experiments.



Opportunities for the project

- Alterra is involved in tranche 3, they are specialised in working with models that can be used in upscaling lab results. On one hand, the results of HSOVa can be used to improve the models; on the other hand, the models can be used to scale the results up to parcel or polder level.



More information

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Bottlenecks of the project

- Upscaling lab results to the field situation is always complex, while four years is too short to do field manipulations.

