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## Mapping Austrian organic soil by using hydro-geomorphological probabilities

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For centuries mires were drained to generate agriculturally useable land. That applies particularly for Europe, where more than 40% of peatlands are considered disturbed and mainly ceased peat accumulation. For Austria, the fraction of disturbed peatland is considered 90%. Estimates assume 180 million tons of carbon stored in soils at grass- and cropland alone.

Despite recent approaches Austria lacks knowledge of peat area particularly on agricultural land, although it is recognized as a key environment for future carbon storage. After all, Austria intends to lower GHG emissions by 36% until 2030 in non ETS sectors by an increase of carbon sequestration in soils but the lack of a standardised and nationwide map on organic soils hampers reliable estimates on GHG emissions from peatland.

Therefore, this study aims to assess all available Austrian soil and environmental data in order to compile a map of probable organic soil areas. As the Austrian soil map (eBOD2) was found the only applicable soil dataset, we focussed on developing an algorithm to specify probable organic soil areas with the combination of hydro-climatological, geomorphological and geological data. We used the climatic water balance in conjunction with groundwater table depth to specify areas with sufficient water supply. By using the topographic wetness index, slope and geomorphic landforms we derived areas with high water storage capacity. Further we used the probability of peat to appear in a certain geological setting as indicator for an impounding setting. We chose three case study regions and used the Austrian soil map to calculate probabilities for every input dataset to appear in conjunction with organic soil. The combined resulting maps show good accordance with organic soil areas compared to eBOD2 besides a tendency for overestimation in wide river valleys. This indicates deficiencies in distinguishing between peatland and other wetlands. To evaluate our approach, we took roughly 600 soil samples from 300 sampling points in the case study regions, which are currently analysed on their carbon content. Recent findings and insights from the field campaigns will be implemented in the map retrieval algorithm for total Austria.