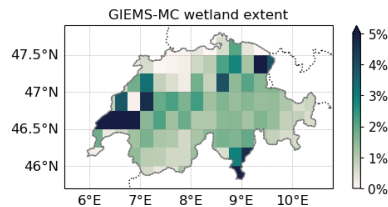


Supplement

Table S1 Input data and forcing information for modelled peatland dynamics using the LPX-Bern model.

Input data	Source/product	Resolution	Period	Reference
Climate	CRU-ERA5-land v3.0	$0.125^{\circ} \times 0.125^{\circ}$	1901–2020	Hersbach et al., 2023; Harris, 2021
Wetland extent	GIEMS-MC	$0.25^{\circ} \times 0.25^{\circ}$	1992–2020	Bernard et al., 2025
Atmospheric CO ₂ concentration	Ice core CO ₂ data and NOAA annual observations	Global	1850–2020	Joos and Spahni, 2008; Lan et al., 2023
Land cover change	Land-use Harmonization 2 (LUH2)	$0.25^{\circ} \times 0.25^{\circ}$	1850–2020	Hurtt et al., 2020
Atmospheric nitrogen deposition	International Global Atmospheric Chemistry (IGAC)/Stratospheric Processes and Their Role in Climate (SPARC) Chemistry-Climate Model Initiative (CCMI)	$0.25^{\circ} \times 0.25^{\circ}$	1850–2020	Hegglin et al., 2016



5 Figure S1 Wetland extent from the GIEMS-MC v1.0 product (Bernard et al., 2025)

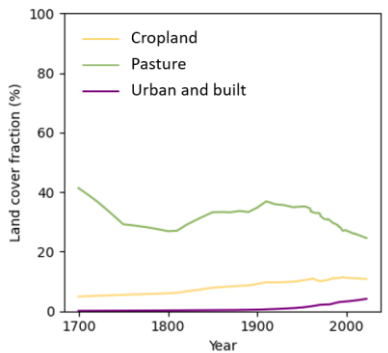
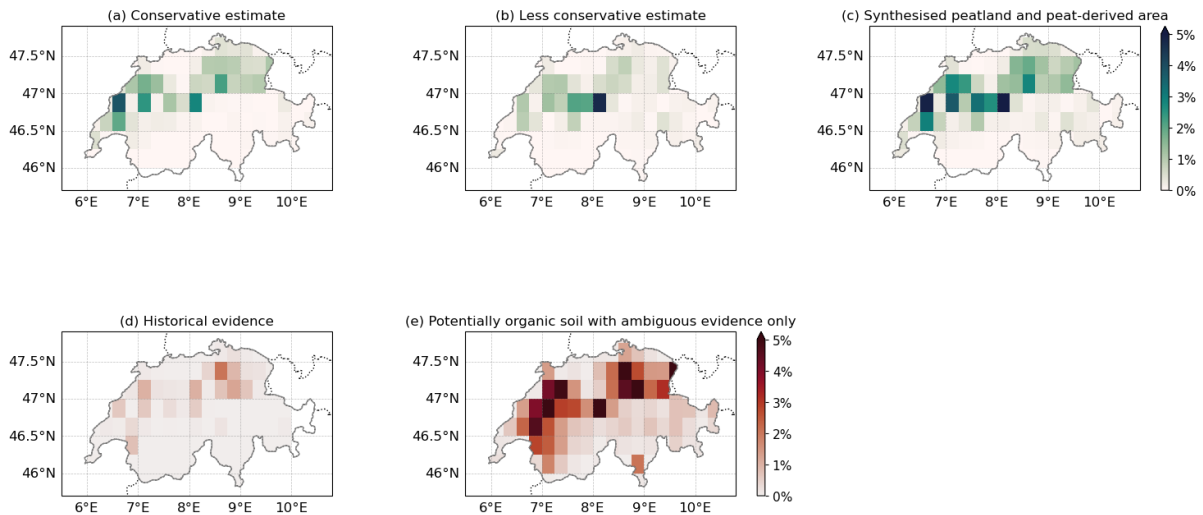
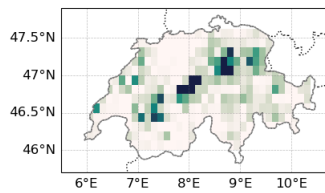


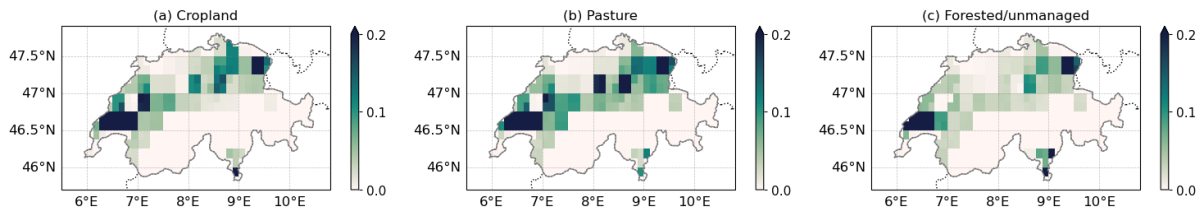
Figure S2 Fractional land-use cover from 1700 to 2020 in Switzerland prescribed by the Land-use Harmonization 2 (LUH2) dataset (Hurtt et al., 2020)



10 **Figure S3** Swiss organic soil maps remapped from Wüst-Galley (2025). (a) Conservative record (185 km²) and (b) less conservative record (142 km²), combined to be (c) synthesised current peatland and peat-derived area (327 km²); (d) Historical record (73 km²), and (e) potential peat area with ambiguous evidence (approximately 600 km²). Fractional grid cell coverage was derived from the original geodatabase (GDB) files and regridded to 0.25 degree resolution for direct visual comparison.



15 **Figure S4** Federal inventories of peatlands, including fens (FOEN, 2025a) and bogs (FOEN, 2025b). Fractional grid cell coverage was derived from the original geodatabase (GDB) files and regridded to 0.125 degree resolution for direct visual comparison.



20 **Figure S5** Modelled peat-derived carbon stocks [Mt C] under (a) cropland, (b) pasture, and (c) forested/unmanaged land in present day (2011–2020) under shallow drainage scenario.

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