

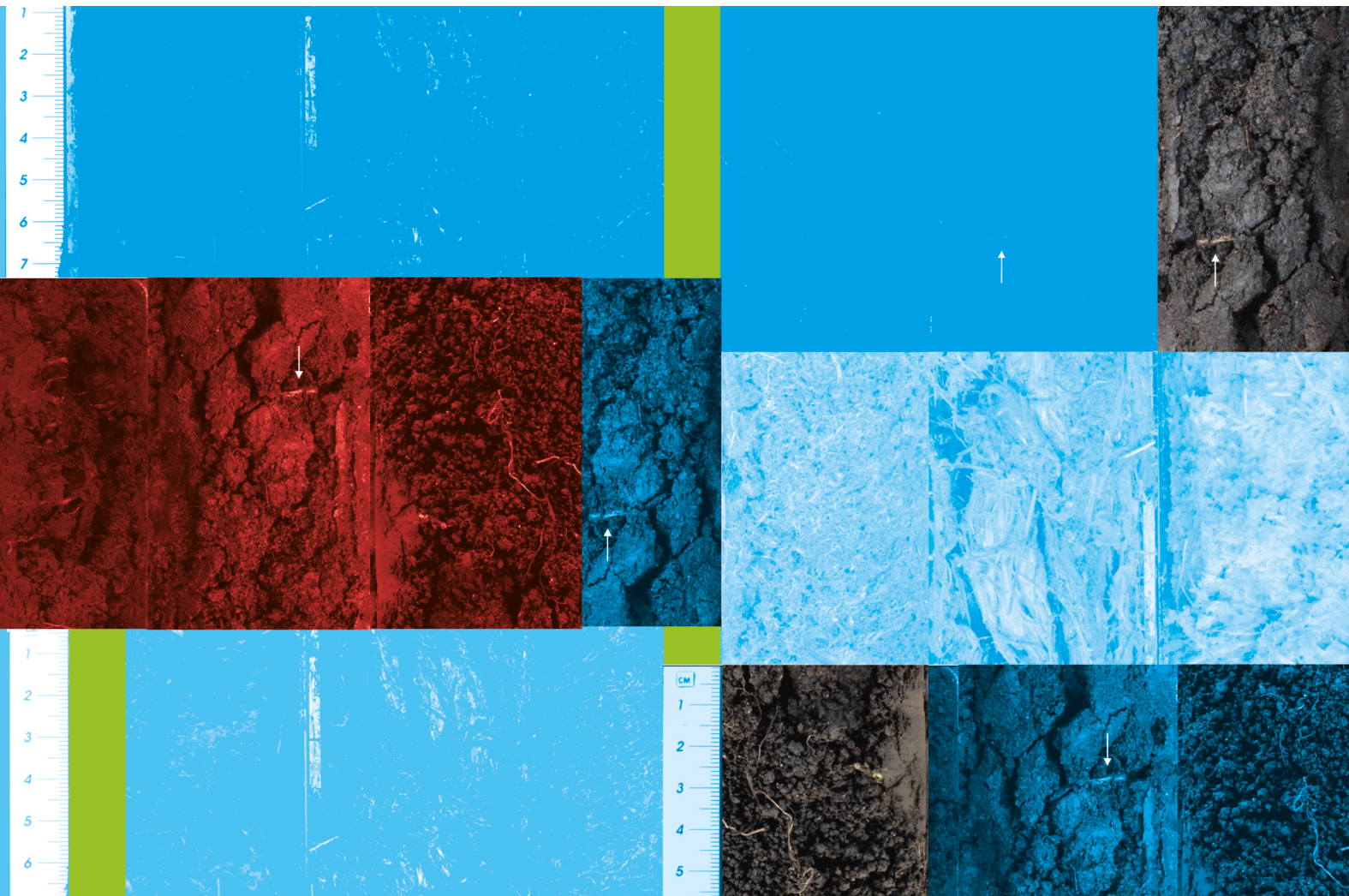


Global Peatland Hotspot Atlas:
The State of the World's Peatlands in Maps
Download the full Global Peatland Hotspot Atlas here



Global peatland degradation

Peatland degradation often begins with artificial drainage, but may also result from overgrazing and trampling, oil spills and burning, waste dumping, and infrastructure development, with climate change further intensifying the degradation.



© 2024 United Nations Environment Programme
ISBN: 978-92-807-4197-1
Job Number: DEP/2684/NA
DOI: <https://doi.org/10.59117/20.500.11822/46635>

This publication may be reproduced in whole or in part and in any form for educational or non-profit services without special permission from the copyright holder, provided acknowledgement of the source is made. The United Nations Environment Programme would appreciate receiving a copy of any publication that uses this publication as a source.

No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from the Secretariat of the United Nations. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to: unep-communication-director@un.org.

Disclaimers:

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory or city or its authorities, or concerning the delimitation of its frontiers or boundaries.

Some illustrations or graphics appearing in this publication may have been adapted from content published by third parties to illustrate the authors' own interpretations of the key messages emerging from such third-party illustrations or graphics. In such cases, the material in this publication does not imply the expression of any opinion whatsoever on the part of United Nations Environment Programme concerning the source materials used as a basis for such graphics or illustrations.

Mention of a commercial company or product in this document does not imply endorsement by the United Nations Environment Programme or the authors. The use of information from this document for publicity or advertising is not permitted. Trademark names and symbols are used in an editorial fashion with no intention on infringement of trademark or copyright laws.

The views expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations Environment Programme. We regret any errors or omissions that may have been unwittingly made.

The boundaries and names shown, and the designations used on the maps provided in this publication do not imply official endorsement or acceptance by the United Nations.

© Maps, photos and illustrations as specified

Suggested Citation

United Nations Environment Programme (2024). Global Peatland Hotspot Atlas: The State of the World's Peatlands in Maps. Visualizing global threats and opportunities for peatland conservation, restoration, and sustainable management. Nairobi.

Production

United Nations Environment Programme (UNEP).
<https://www.unep.org/resources/report/global-peatland-hotspot-atlas-2024>

Supported by:

The Global Peatland Hotspot Atlas is a product supported by the Michael Succow Foundation, partner in the Greifswald Mire Centre, under the umbrella of the Global Peatlands Initiative: Assessing, Measuring and Preserving Peat Carbon project (GPI project) which is funded by the International Climate Initiative (IKI) of Germany.

Supported by:



based on a decision of the German Bundestag

Acknowledgements

The United Nations Environment Programme (UNEP) would like to thank the Greifswald Mire Centre (GMC) for the access to their Global Peatland Database (GPD) and for the production of the Global Peatland Map and all Thematic Maps.



UNEP would also like to thank the Global Peatlands Initiative (GPI) Team for the overall coordination of this Atlas.

Authors

Alexandra Barthelmes (GMC/DUENE e.V.),
Cosima Tegetmeyer (GMC/DUENE e.V.), Hans Joosten (GMC/ University of Greifswald), Patrick Scheel (UNEP).

Production, Coordination and Review

Patrick Scheel (UNEP), Jan Peters (GMC/MSF),
Dianna Kopansky (UNEP).

Design and layout

igel+ente, Büro für Gestaltung, Fotografie und
Kommunikation Greifswald, Germany
Anna Knüppel & Michael Schröder (www.igelundente.de)
Nora Prinz (www.noraprinz.de)

Thanks also to:

Caroline Borowski, Martha Burckhardt, the Global Peatland Database mapping team, the contributors of the UNEP 2022 Global Peatland Assessment, Susan Gardner, Jane Muriithi, Mónica López Conlon, Cisca Devereux, and Fabrice Inkonyo

Global peatland degradation

Peatland degradation has multiple causes and a wide range of effects. Heavily degraded peatlands have lost crucial functions such as carbon sequestration and storage, provision of habitat for rare species, cleaning, regulating and storing water, and local climate cooling. In healthy peatlands, functional relationships exist between plants, water, and peat, with changes in one component affecting eventually

all others: vegetation changes first, followed by hydrology, and later the peat body itself. Table 1 illustrates various stages of peatland degradation, with components of increasing being affected. When more inert components are degraded (e.g., the peat itself), full restoration often requires more complex and labor-intensive efforts or even becomes impossible [4].



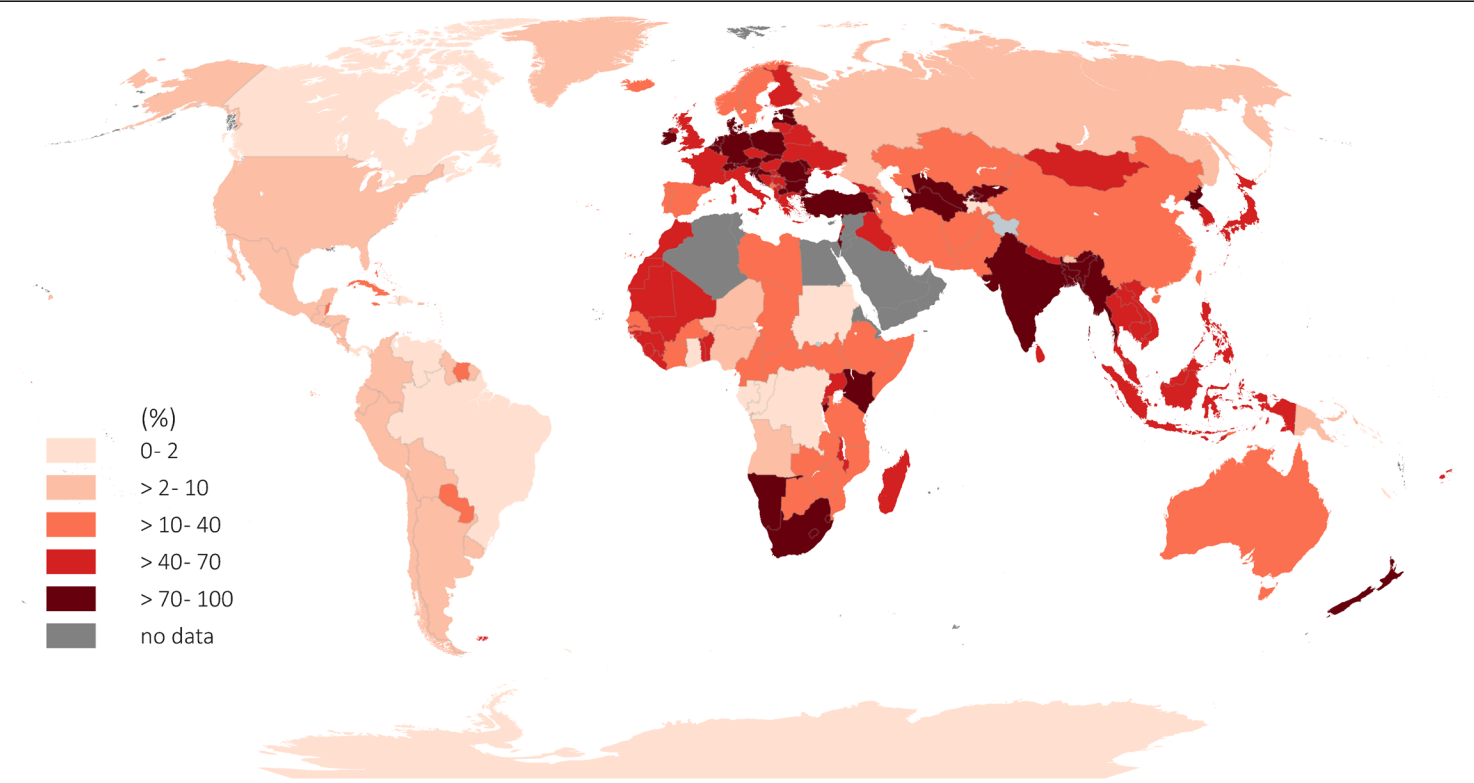
Figure 1 undegraded peat [4]



Figure 2 degraded peat [4]

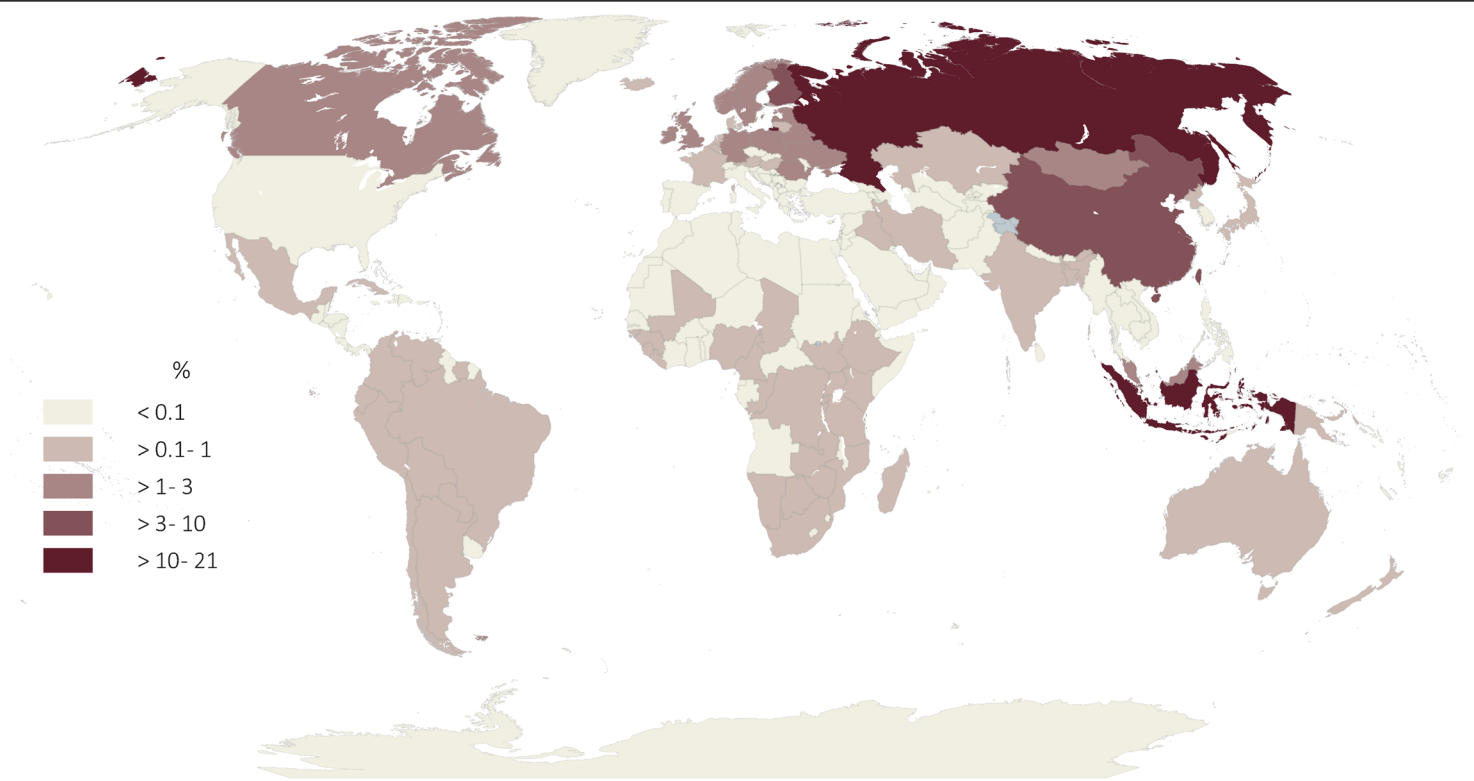


Peatland degradation often begins with artificial drainage, but may also result from overgrazing and trampling, oil spills and burning, waste dumping, and infrastructure development, with climate change further intensifying the degradation.



Map 1 Global peatland degradation distribution at a national level [2]

The share of degrading peatlands on a national level.



Map 2 Global peatland degradation distribution at a global level [2]

The share of countries on the degrading peatlands global level.

Table 1 Peatland degradation intensities [3]

Peatland degradation intensities (after Convention of Wetlands 2022)

Degradation intensity		Peatland components					
		increasing inertia →					
		Plants		water		peat	
increased restoration action required ↓	Minimal						
	Minor						
	Modest						
	Moderate						
	Major						
	Most						
	Maximal						
		not affected		moderately affected		strongly affected	

Peatland degradation involves changes in plants, water, and peat qualities over time. The most apparent signs of degradation is vegetation change, the most grave consequences have irreversible changes in the structure and porosity of the peat by decomposition and compaction and its eventual breakdown into a cracked, crumbed, and even powder-like structure (Figures 1 and 2). In the initial stages of **minimal** or **minor** degradation, vegetation may be damaged or removed, but the hydrology and the peat remain intact (top right figure). **Modest** degradation involves recent drainage and vegetation change, while **moderate** degradation already shows evident changes in peatland hydraulics, though restoration still remains feasible. **Major** degradation occurs when long-term, deep drainage and destructive use have caused irreversible changes in the structure of the peat, making it compact and much less porous and later also loose and with newly formed macropores. The **most** severe degradation is when the peat body has become completely out of hydrological balance due to subsidence, peat extraction, erosion, fire, or oxidation. Finally, in the **maximal** stage, most or all of the peat has been removed or oxidized, causing the peatland to virtually cease being a peatland

[3, 4]. In more than 30 countries, especially in Europe and Asia, where peatlands have long been used for the production of food, fodder, fiber and fuel, over 70 % of national peatlands have been degraded (Map 1 [2]). Notably, only a few countries account for the majority of global peatland degradation, with over 50 % attributed to Indonesia, Russia, Finland and China (Map 2). Among these, only Indonesia is a hotspot of peatland restoration and raising water levels over substantial peatland areas. Overall, future peatland mapping is likely to reveal more degradation in other regions as well.

Marginalized communities, particularly women, who depend on peatlands for water and essential resources, including food security, are significantly affected by peatland degradation. This degradation undermines the ecosystem services these areas provide, disproportionately impacting vulnerable communities that rely on these natural resources to sustain their livelihoods [1].

Sources: 1. UNEP (2022) Global Peatlands Assessment – The State of the World's Peatlands: Evidence for action toward the conservation, restoration, and sustainable management of peatlands. Main Report. Global Peatlands Initiative. United Nations Environment Programme, Nairobi. 2. Greifswald Mire Centre Database. Statistics for (drained) peatlands and GHG emissions in 268 countries and regions. 3. Convention on Wetlands (2021) Global guidelines for peatland rewetting and restoration. Ramsar Technical Report No. 11. Gland, Switzerland: Ramsar Secretariat of the Convention on Wetlands. 4. Luthardt, V., Schulz, C., Meier-Uhlir, R. (2015) Stockbriefe Moorsubstrate, 2. Auflage. Hochschule für nachhaltige Entwicklung Eberswalde, Eberswalde, Germany. 154 S. DOI: 10.23689/edgeo-3724.