

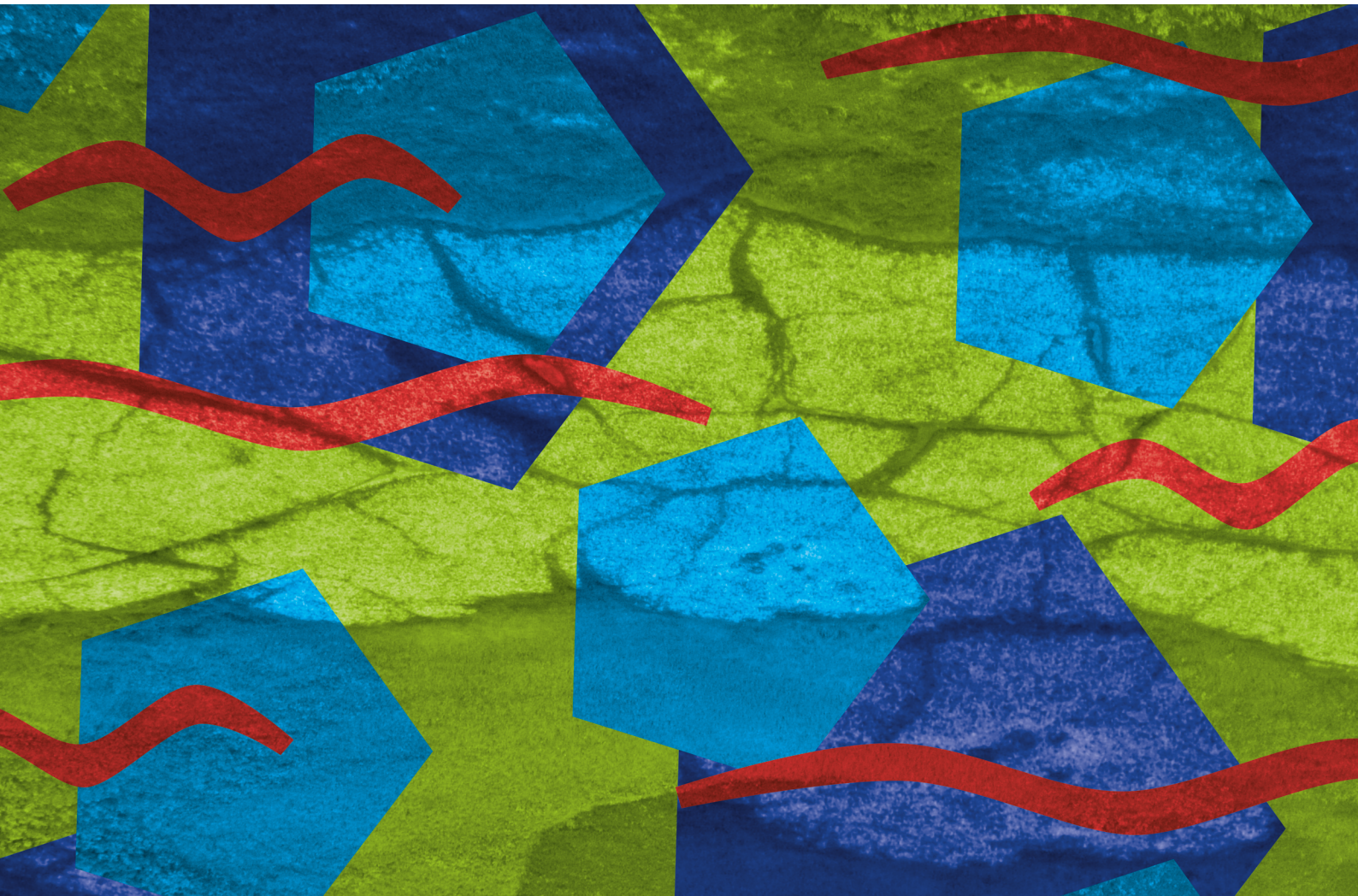


Global Peatland Hotspot Atlas:
The State of the World's Peatlands in Maps
Download the full Global Peatland Hotspot Atlas here



Peatlands of Asia

Asia hosts the world's largest peatland area, from Arctic and boreal regions to temperate zones and Southeast Asia's tropical peat swamp forests. While diverse and widespread, over 60% are degraded in some countries due to drainage, agriculture, and deforestation.



© 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).

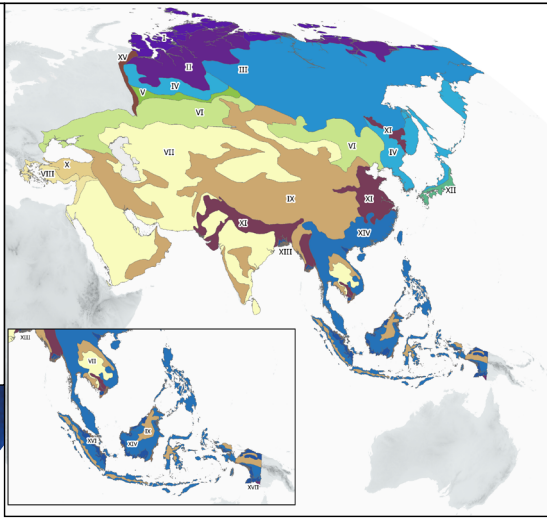
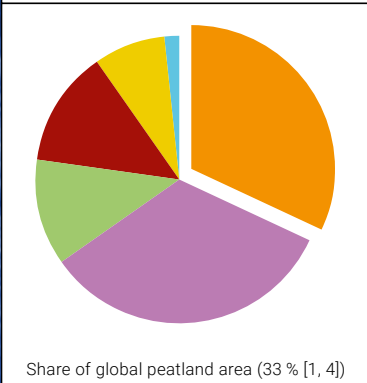
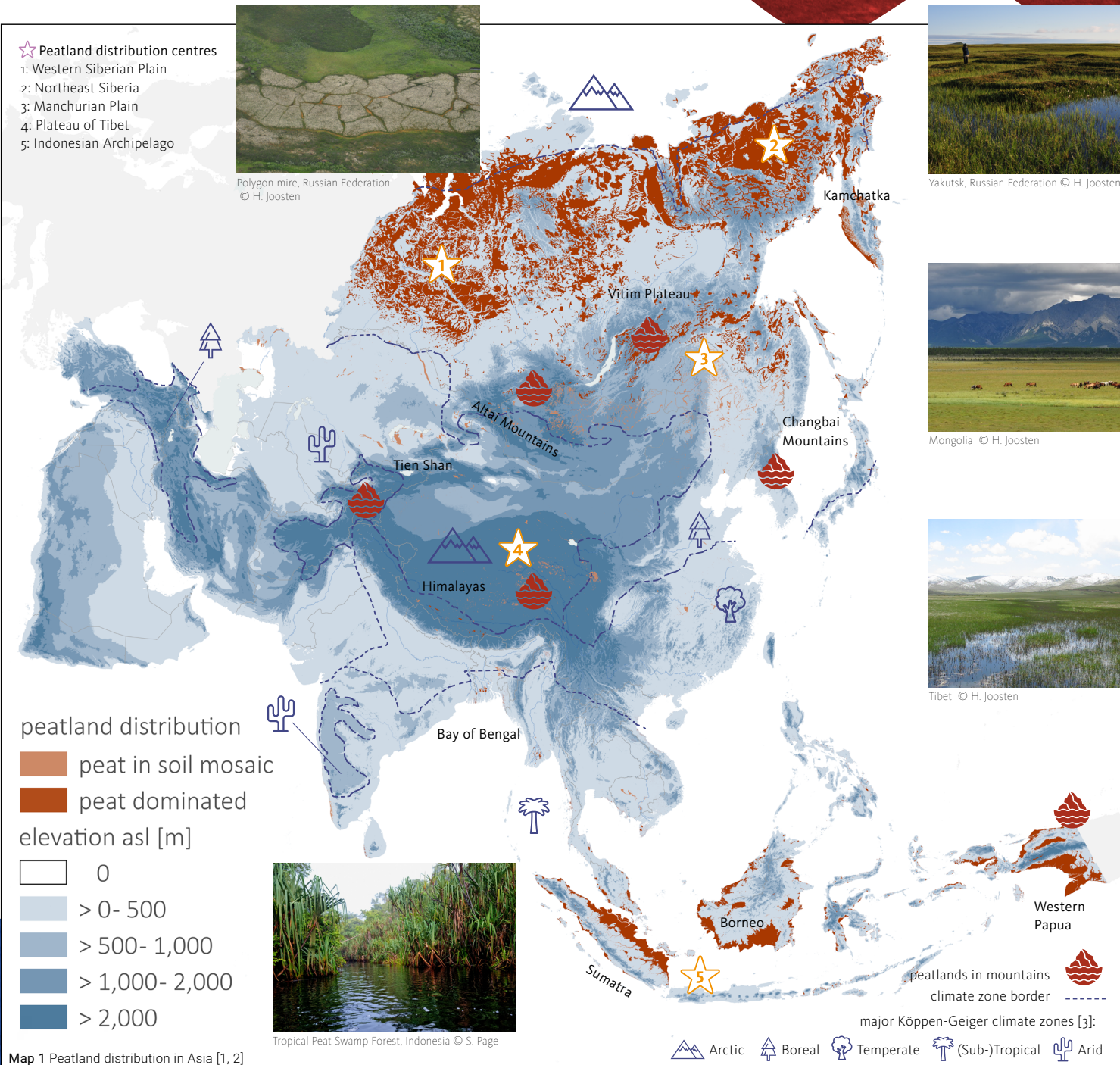
Design and layout

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

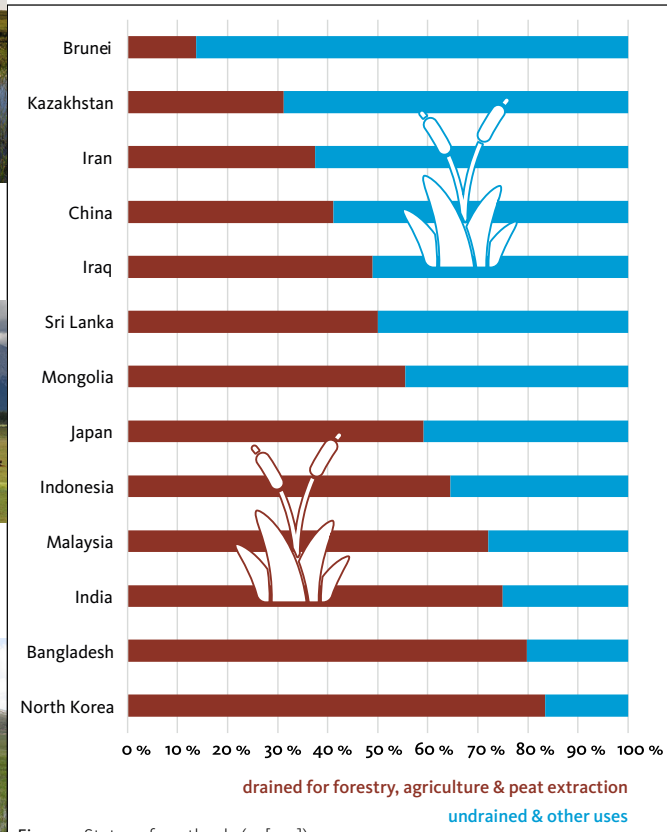
Thanks also to:

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

Peatlands of Asia



I Arctic seepage and polygon mire, II N-Siberian palsa mires, III C- and E-Siberian fen and bog, IV Typical raised bog, V Temperate fen, VI Grassy valley bottom and depression marsh, VII Drylands grassy marsh, VIII Mediterranean marsh, IX Asian mountain compound fen and bog, X Temperate grassy marsh, XI Floodplain fen and marsh, XII Temperate depression marsh, XIII Asian mangroves and coastal marsh, XIV Asian (sub-)tropical marsh, XV Ural mountain fen, XVI S-Asian (peat) swamp, XVII Trans Fly savanna marsh and swamp



- **Total peatland area: 161 million ha**
- **Distribution: Western Siberian Plain, Northeast Siberia, Manchurian Plain, Plateau of Tibet, Indonesian Archipelago**
- **Peatland cover over total regional surface area: 3.7 %**
- **Share of global peatland area: 33 %**
- **Degraded peatlands: 13 %**
- **Annual GHG emissions from peatlands: 1,021 Mt CO₂e / yr**
- **Share of global GHG emissions from peatlands: 53 %**
- **Peatlands within protected areas: 10 %**
- **Top 5 countries with largest peatland area:**
 1. Asian Russia (118.5 million ha)
 2. Indonesia (21 million ha)
 3. China (13 million ha)
 4. Mongolia (2.7 million ha)
 5. Malaysia (2.5 million ha)
- **Total peatland carbon stock: 182,417 Mt C [4]**
- **Threatened peatland species: Flora: 20 VU, 25 EN, 13 CR; Fauna: 135 VU, 144 EN, 56 CR [7]**
- **Ramsar Wetlands of International Importance with peat: 71 sites (18.2 % of total Ramsar sites in Asia [5])**

Asia is the largest continent and also holds the largest area of peatlands worldwide [1, 2]. As the continent extends from the Arctic to the tropics, it hosts a wide variety of peatland types shaped by diverse climates, ranging from polar to tropical, and from wet to arid conditions [3]. Accordingly, peatlands differ largely in their water supply, vegetational composition and peat accumulation rates. Nearly half of the peatlands are located in the arctic and boreal zones, while about a quarter occur in the temperate zone and another quarter in the tropics. **Polygonal peatlands** occur in the arctic permafrost and are mainly dominated by peat mosses (*Sphagnum*), brown mosses, dwarf shrubs and sedge (*Cyperaceae*) species. Arctic peatland vegetation is not diverse, but represents unique ecosystem types. **Palsa and Aapa mires** in the subarctic and boreal zones maintain complex patterns of drier hummocks with dwarf shrubs, mosses and lichen, and wet hollows dominated by sedges, cotton-grass, and *Sphagnum* communities. Sedges (*Cyperaceae*), grasses (*Poaceae*) and mosses play a greater role in peatlands of the continental temperate and sub-tropical zone, whereas in the tropical zone, extensive **Peat Swamp Forests (PSFs)** and **mangroves** are most prominent on peatlands, especially in SE Asia. Here, PSFs have the highest floral diversity in peatlands globally (at least 1,524 vascular plant species). Besides SE Asia, (sub-)tropical peatlands extend from coastal areas of the Bay of Bengal to the foothills of the Himalayas in Bangladesh, India, and Pakistan, as well as in coastal Sri Lanka and Kerala (India).

Plateau and mountain peatlands prevail in the cold and arid climates of the Central Asian mountains (e.g. Himalaya, Tien Shan, Altai), and the Changbai Mountains (NE China). In the tropical zone, peat accumulation began earlier than in the temperate and polar regions. This was sustained by continuous large, mainly belowground litter inputs from evergreen trees, in contrast to sedge, dwarf shrubs, and mosses, which are the peat-forming vegetation in temperate and boreal biomes. **Despite this available knowledge, data on peatlands distribution need to be improved across all of Asia [1]. The peatlands of temperate, arid, and tropical Asia face severe drainage and overexploitation, leading to significant greenhouse gas emissions, with SE Asia being the largest peatland emission hotspot globally.** Key drivers of peatland degradation across the continent include permafrost thawing in the north, overgrazing by livestock and arable farming in Central Asia, and deforestation and drainage for oil palm, pulp wood and food crops in the tropics. **The peatlands of Bangladesh, India, Malaysia and Indonesia are more than 60 % degraded in each country [1].** Moreover, climate change poses a major risk for northern peatlands due to widespread permafrost thawing. Peatlands here are affected by road and infrastructure construction for oil and gas production too.

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. Grefswald Mire Centre (2022) Global Peatland Map 2.0. Underlying dataset of the UNEP Global Peatland Assessment. 3. Peel, M. C., Finlayson, B. L., McMahon, T. A. (2007) Updated world map of the Köppen-Geiger climate classification. Hydrol. Earth Syst. Sci. 1633-1644. 4. Grefswald Mire Centre (2022) Country-wise Global Peatland emission Database (2022) Statistics for (drained) peatlands and GHG emissions in 268 countries and regions. 4. Joosten, H. (2009). The Global Peatland CO₂ Picture. Peatland status and drainage associated emissions in all countries of the World. Wetlands International, Ede, 10 p. + tables. 5. Data extracted from the Ramsar Sites Information Service 6. Grefswald Mire Centre (2024) Draft peatland regionality maps for the World. contact: alex.barthelemy@grefswaldmire.de 7. Data extracted from the IUCN Red List of Threatened Species (VU = vulnerable; EN = endangered; CR = critically endangered).