

How important are peatlands globally in providing drinking water resources?

Jiren Xu, Paul Morris, and Joseph Holden

water@leeds, School of Geography, University of Leeds, Leeds, United Kingdom

The potential role of peatlands as water stores and sources of downstream water resources for human use is often cited in publications setting the context for the importance of peatlands, but is rarely backed up with substantive evidence. We sought to determine the global role of peatlands in water resource provision. We developed the Peat Population Index (PPI) that combines the coverage of peat and the local population density to show focused (hotspot) areas where there is a combination of both large areas of peat and large populations who would potentially use water sourced from those peatlands. We also developed a method for estimating the proportion of river water that interacted with contributing peatlands before draining into rivers and reservoirs used as a drinking water resource. The Peat Reservoir Index (PRI) estimates the contribution of peatlands to domestic water use to be 1.64 km³ per year which is 0.35 % of the global total. The results suggest that although peatlands are widespread, the spatial distribution of the high PPI and PRI river basins is concentrated in European middle latitudes particularly around major conurbations in The Netherlands, northern England, Scotland (Glasgow) and Ireland (Dublin), although there were also some important systems in Florida, the Niger Delta and Malaysia. More detailed research into water resource provision in high PPI areas showed that they were not always also high PRI areas as often water resources were delivered to urban centres from non-peat areas, despite a large area of peat within the catchment. However, particularly in the UK and Ireland, there are some high PRI systems where peatlands directly supply water to nearby urban centres. Thus both indices are useful and can be used at a global level while more local refinement enables enhanced use which supports global and local peatland protection measures. We now intend to study the impacts of peatland degradation and climate change on water resource provision in hotspot PPI and PRI regions.