

Assessment of anthropogenic pressures on South European Atlantic bogs (NW Spain) based on hydrochemical data

Carmen Cillero · Ramón A. Díaz-Varela ·
Marco Rubinos · Pablo Ramil-Rego

Received: 24 September 2015 / Revised: 5 April 2016 / Accepted: 15 April 2016 / Published online: 6 May 2016
© Springer International Publishing Switzerland 2016

Abstract This study aims to identify the main mechanisms controlling the hydrochemistry of nine Atlantic bogs. The basic hypotheses are (i) the main functional characteristics of these wetlands (e.g. minerotrophic influence) can be traced and accurately quantified by seasonal hydrochemistry monitoring and (ii) influences (oceanity, pollution) of the surrounding environment at different scales can be statistically outlined. The effect of several landscape variables on bog water chemistry was assessed by combining water analysis with the analysis of spatial data via

geographical information system (GIS) tools. The results did not show any significant relationship between hydrochemistry and land use/land cover at the watershed scale, but we found a significant relationship between the Zn concentration and the distance to a nearby power station (located outside the watersheds). A similar link was also established with $N-NH_4^+$, in this case most likely related to the farming activities. Our results allowed us to identify the period of late summer to early autumn as the most appropriate for detecting minerotrophic traits in South European Atlantic mires. The study showed that an integrated analysis of hydrochemical data with territorial variables is a useful tool for management purposes in peatlands.

Guest editors: Pierluigi Viaroli, Marco Bartoli & Jan Vymazal /
Wetlands Biodiversity and Processes: Tools for Management
and Conservation

Electronic supplementary material The online version of this article (doi:10.1007/s10750-016-2778-7) contains supplementary material, which is available to authorized users.

C. Cillero (✉) · M. Rubinos · P. Ramil-Rego
IBADER GI-1934-TeBio, University of Santiago de
Compostela, Campus Lugo, 27002 Lugo, Spain
e-mail: carmen.cillero.castro@gmail.com

R. A. Díaz-Varela
Botany Department GI-1809-BIOAPLIC, Escola
Politécnica Superior de Lugo, University of Santiago de
Compostela, Campus Universitario S/N., 27002 Lugo,
Spain

C. Cillero · M. Rubinos
3edata, R&D Department, Vivero Fundación CEL,
O Palomar S/N., 27004 Lugo, Spain

Keywords Bog · Hydrochemistry · Seasonal data ·
Anthropogenic pressures · Pollution · Landscape ·
Spatial data · Geographical information systems

Introduction

Peatlands are valuable ecosystems worldwide, not only for their central role in the global climate system as C sinks and reservoirs but also for their use as archives of environmental changes. The study of the hydrology and the chemistry of bog waters in Europe relies mainly on the conceptual framework of “ecological gradients” or “directions of variation” (Sjörs,