Accepted Manuscript

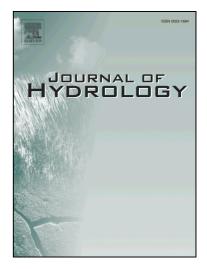
Research papers

Transformation of snow isotopic signature along groundwater recharge pathways in the Canadian Prairies

Igor Pavlovskii, Masaki Hayashi, Matthew R. Lennon

PII:	S0022-1694(17)30657-1
DOI:	https://doi.org/10.1016/j.jhydrol.2017.09.053
Reference:	HYDROL 22273

To appear in: *Journal of Hydrology*



Please cite this article as: Pavlovskii, I., Hayashi, M., Lennon, M.R., Transformation of snow isotopic signature along groundwater recharge pathways in the Canadian Prairies, *Journal of Hydrology* (2017), doi: https://doi.org/10.1016/j.jhydrol.2017.09.053

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Transformation of snow isotopic signature along groundwater recharge pathways in the

Canadian Prairies

Igor Pavlovskii*, Masaki Hayashi, Matthew R. Lennon

Department of Geoscience, University of Calgary, 2500 University Dr NW, Calgary, Alberta,

T2N 1N4, Canada

*corresponding author (ipavlovs@ucalgary.ca)

Abstract

Application of stable isotope methods to evaluate the contribution of different water sources to groundwater recharge relies on the knowledge about isotopic signatures of these sources. The data collected at study sites in the Canadian Prairies show that snowpack isotopic signatures exhibit a high spatial variability over a small scale (< 100 m) limiting the usefulness of point samples to estimate an average isotopic composition of snow over a large area. Isotopic signatures of snowmelt runoff can be different from those of pre-melt snowpack, further undermining the applicability of snow isotopic signature to characterisation of snowmelt-driven hydrological processes. Accounting for the actual signature of snowmelt runoff has strong effects on its perceived role in recharging groundwater. The data also show that diffuse and depression-focussed components of groundwater recharge have different isotopic signatures, where the latter closely resembles snowmelt runoff.

Keywords: stable isotopes, snow, snowmelt runoff, groundwater recharge, Canadian Prairies

1. Introduction

Snowpack accumulation and depletion are important elements of the hydrologic cycle in many parts of the world (Lehning, 2013; Lundberg et al., 2015; Tetzlaff et al., 2015) and have

Download English Version:

https://daneshyari.com/en/article/8894636

Download Persian Version:

https://daneshyari.com/article/8894636

Daneshyari.com