

Author: [ADVANCED](#)

Volume Page

Keyword: [TOP](#) > [Available Volumes](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1882-3416

Hydrological Research Letters

Vol. 2 (2008) pp.9-13

[\[PDF \(337K\)\]](#) [\[References\]](#) [\[Supplementary Materials\]](#)**An Estimate of Local Bomb-Produced ^{36}Cl Fallout Using the Depth Profile of Groundwater in the Tsukuba Upland, Central Japan**[Yuki Tosaki](#)¹⁾²⁾, [Norio Tase](#)³⁾, [Masaya Yasuhara](#)⁴⁾, [Yasuo Nagashima](#)²⁾, [Kimikazu Sasa](#)²⁾ and [Tsutomu Takahashi](#)²⁾

- 1) Geoenvironmental Sciences, Graduate School of Life and Environmental Sciences, University of Tsukuba
- 2) AMS Group, Tandem Accelerator Complex, University of Tsukuba
- 3) Sustainable Environmental Studies, Graduate School of Life and Environmental Sciences, University of Tsukuba
- 4) Research Core for Deep Geological Environments, Geological Survey of Japan

(Received: September 20, 2007)

(Accepted for publication: January 11, 2008)

Abstract:

The depth profile of $^{36}\text{Cl}/\text{Cl}$ ratio in groundwater was investigated in the Tsukuba Upland of central Japan. The obtained results clearly show the influence of bomb-produced ^{36}Cl ; the highest $^{36}\text{Cl}/\text{Cl}$ ratio is about one order of magnitude greater than the natural background ratio (1×10^{-13}). The vertical distribution of ^{36}Cl is consistent with previous observations using ^3H and Darcy's law. From the profile, the total bomb-produced ^{36}Cl fallout in the upland is 2.3×10^{12} atoms/m² after the correction for surface runoff (c.f. 2.4×10^{12} atoms/m² at the Dye-3 site, Greenland) and a scaling factor of 0.96 was obtained (c.f. 2.5 based on the simplified latitudinal fallout distribution model). We then reconstructed the local fallout history of ^{36}Cl based on the Dye-3 data (scaled with a factor of 0.96 for the Tsukuba Upland) and the mean ^{36}Cl flux, produced in the atmosphere from cosmic rays and measured 30 atoms m⁻² s⁻¹ in the upland. The ratio of the maximum bomb-peak fallout to the average natural background flux of meteoric ^{36}Cl is consistent with that of measured data in Nepal. The result implies that the simplified latitudinal distribution model for ^{36}Cl

deposition is not easily applicable for the prediction of the bomb-produced ^{36}Cl fallout pattern.

[\[PDF \(337K\)\]](#) [\[References\]](#) [\[Supplementary Materials\]](#)



Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Yuki Tosaki, Norio Tase, Masaya Yasuhara, Yasuo Nagashima, Kimikazu Sasa and Tsutomu Takahashi: "An Estimate of Local Bomb-Produced ^{36}Cl Fallout Using the Depth Profile of Groundwater in the Tsukuba Upland, Central Japan", Hydrological Research Letters, Vol. **2**, pp.9-13, (2008) .

doi:10.3178/hr1.2.9

JOI JST.JSTAGE/hr1/2.9

Copyright (c) 2008 Japan Society of Hydrology and Water Resources



[Japan Science and Technology Information Aggregator, Electronic](#)

