

EGU21-9149, updated on 16 Oct 2021

<https://doi.org/10.5194/egusphere-egu21-9149>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



## Spatial variation of stream water chemistry in the Shimanto River Basin in southwestern Japan: A comparison of results in 1999 and 2020

Yoshiyuki Inagaki<sup>1</sup>, Masahiro Inagaki<sup>1</sup>, Koji Shichi<sup>1</sup>, Shuichiro Yoshinaga<sup>2</sup>, Tsuyoshi Yamada<sup>3</sup>, Satoru Miura<sup>3</sup>, Yoshiki Shinomiya<sup>3</sup>, and Kazumichi Fujii<sup>3</sup>

<sup>1</sup>Forestry and Forest Products Research Institute, Shikoku Research Center, Kochi, Japan (yinagaki@affrc.go.jp)

<sup>2</sup>Forestry and Forest Products Research Institute, Tama Forest Science Garden, Hachioji, Japan

<sup>3</sup>Forestry and Forest Products Research Institute, Tsukuba, Japan

Acidic deposition derived from human activities causes negative effects on nutrient cycling in forest ecosystems. However, nutrient cycling of forest ecosystems is expected to recover because the emission of pollutants is generally decreasing in recent years. However, the extent of recovery would be differed between forest ecosystems in different climatic conditions. The study investigated changes of stream water chemistry of forest ecosystems in Shimanto River Basin in southwestern Japan. The 92 samples of stream water were collected from forested watersheds in summer of 1999 and 2020 and chemistry of the samples was compared. The mean pH value of the stream water in 2020 (7.60) was higher than that in 1999 (7.29). The mean concentration of potassium ion increased by 2.1% whereas that of sodium, calcium, and magnesium ions decreased by 2.5%, 10.3%, and 8.6%, respectively. The mean concentration of chloride, nitrate and sulfate ions decreased by 24.8%, 9.4% and 22.5%, respectively whereas that of bicarbonate increased by 0.7%. The relationship between mean annual temperature and the ratio of ion concentration in 2020 to that in 1999 was analyzed. The ratio of calcium and manganese concentration was lower at warmer sites. The ratio of sulfate concentration was lower at warmer sites whereas the ratio of chloride concentration was not related with mean annual temperature. The results suggest that the runoff of sulfate and chloride from forest ecosystems in the Shimanto River Basin have decreased presumably due to the reduced input of these elements and that the residence time of sulfur in forest ecosystems is shorter in warmer sites as indicated by the greater reduction of sulfate concentration.