

## 福井県大野盆地の地下水の地球化学的水脈診断

## Geochemical diagnosis of groundwater flow system in the Ohno basin, Fukui prefecture

\*中野 孝教<sup>1</sup>、申 基澈<sup>1</sup>、大田 民久<sup>1</sup>、草野 由貴子<sup>1</sup>、陀安 一郎<sup>1</sup>、山田 佳裕<sup>2</sup>、横尾 頼子<sup>3</sup>、辻村 真貴<sup>4</sup>、池田 浩一<sup>4</sup>、帰山 寿章<sup>5</sup>、山田 明弘<sup>5</sup>、下島 浩平 浩平<sup>5</sup>、小澤 弘幸<sup>5</sup>

\*Takanori Nakano<sup>1</sup>, Kicheol Shin<sup>1</sup>, Tamihisa Ohta<sup>1</sup>, Yukiko Kusano<sup>1</sup>, Ichiro Tayasu<sup>1</sup>, Yoshihiro Yamada<sup>2</sup>, Yoriko Yokoo<sup>3</sup>, Maki Tsujimura<sup>4</sup>, Koichi Ikeda<sup>4</sup>, Toshiaki Kaeriyama<sup>5</sup>, Akihiro Yamada<sup>5</sup>, Kouhei Shitajima<sup>5</sup>, Hiroyuki Ozawa<sup>5</sup>

1.大学共同利用機関法人 人間文化研究機構 総合地球環境学研究所、2.香川大学農学部、3.同志社大学理工学部、4.筑波大学生命環境系、5.大野市役所

1.Research Institute for Humanity and Nature, Inter-University Research Institute Corporation National Institutes for the Humanities, 2.Faculty of Agriculture, Kagawa University, 3.Faculty of Science and Engineering, Doshisha University, 4.Faculty of life and environmental Sciences, University of Tsukuba, 5.Municipal office of Ohno city

Shallow groundwater system is developed in the city area of the northwestern Ohno basin, Fukui prefecture. This groundwater, termed as city-GW, has been used for daily lives and industries, but the recharge area and flow system of city-GW remain unclear. For the sustainable use of city-GW, we determined multiple components for the surface water and well water collected by elementary pupils as environmental education.

The oxygen and hydrogen isotope ratios of the city-GW decrease from  $-8.1\text{‰}$  and  $-48\text{‰}$  to  $-9.1\text{‰}$  and  $-57\text{‰}$  toward the west. The city-GW is divided by an interval of  $0.1\text{‰}$  in the  $d^{18}\text{O}$  value and  $0.8\text{‰}$  in the  $d^2\text{H}$  value. As the groundwater level decreases from south to west, it is likely that each isotope envelope corresponds to the flow channel. This view is consistent with the spatial distribution of several dissolved ions such as  $\text{Ca}^{2+}$ ; the high concentration of  $\text{Ca}^{2+}$  corresponds to the groundwater with a uniform  $d^{18}\text{O}$ - $d^2\text{H}$  value ( $-8.9\text{‰}$  -  $-8.8\text{‰}$  and  $-52\text{‰}$  -  $-51.2\text{‰}$ ). It is likely that the city-GW is recharged mainly from the southern alluvial fan where agriculture is active. This is consistent with the high concentrations of As and Mo in southeastern city-GW, suggesting the contribution of fertilizer.

The western city-GW is enriched in  $\text{NO}_3^-$ , indicating the source of N to be human activities such as sewerage. Several components (K,  $\text{SO}_4$ ) in the western city-GW is further subdivided into the north and the south by Mt. Kameyama, which is composed of granite. This result suggests that the geochemical nature of aquifer sediments in the north are different from that in the south by this mountain. This view is compatible with the analysis for the fluctuation record of water level at 14 monitoring sites in the city-GW area. We consider that Mt. Kamayama plays a role as a barrier for the southerly flow of the city-GW. Thus, the water quality mapping is effective for elucidating the flow system of groundwater.

キーワード：地下水、大野盆地、水脈、安定同位体

Keywords: groundwater, Ohno basin, flow channel, stable isotope