

Characteristics of groundwater chemical composition on Ryukyu limestone region in southern part of Okinawa

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The study area is located in the southern part of Okinawa Main Island, Japan, where Ryukyu limestone is extensively distributed. In this study field surveys were conducted to examine the characteristics of groundwater quality over a wide coastal area with agricultural land use. We studied the characteristics of groundwater chemical composition (the four major cations (Na⁺, K⁺, Mg²⁺, Ca²⁺) and four major anions (Cl⁻, HCO₃⁻, SO₄²⁻, NO₃⁻) in this region by using observation data at springs and observation wells. It was found that the chemical composition showed CaHCO₃⁻ type of groundwater from limestone aquifer where CaCO₃ dissolution was predominant process yielding atypical bird-like shape in the Stiff diagram. The other components of groundwater also were indicated high concentrations so that the compositions were dominated by Na⁺ and Cl⁻ reflecting salt water and NO₃-N and SO₄²⁻ related agricultural land use in this area.

Keywords: Groundwater, Chemical composition, Ryukyu limestone