

Suntory Global Innovation Center Publishes Research Findings on Groundwater Recharge Estimation Methodology

— Research paper featured in the international hydrology journal “Hydrological Processes” —

Tokyo, JAPAN (November 26, 2025) – Suntory Global Innovation Center (SIC), the research and development arm of Suntory Group, in collaboration with University of Tsukuba, the University of Tokyo, and other partners, has published a research paper on an integrated modeling framework for estimating groundwater recharge^{*1} in mountainous regions. The paper, titled “Enhanced Estimation of Groundwater Recharge in Mountainous Headwaters Using High-Resolution Spatial Modelling,” has been published in the international hydrology^{*2} journal “Hydrological Processes”.

From SIC, Shinjiro Yano contributed to this work alongside researchers from Suntory Holdings, Geosphere Environmental Technology Corp., University of Tsukuba Faculty of Life and Environmental Sciences, and the University of Tokyo Graduate School of Frontier Sciences.

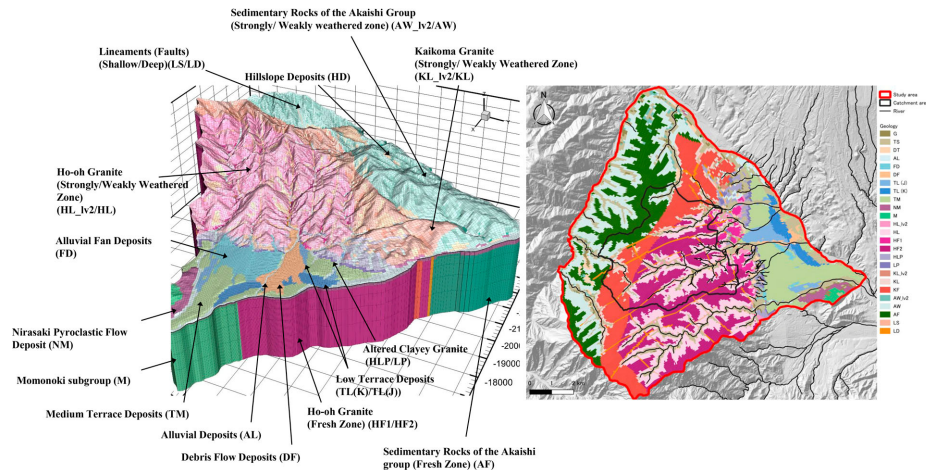
The modeling framework developed through this study is already being applied in initiatives such as Suntory Group’s water conservation program, [Suntory Natural Water Sanctuary](#), and in the services provided by [Water Scape](#), a new Suntory Group company that supports businesses and local communities in securing sustainable water supplies.

Research Background

Water is an indispensable resource that sustains human life and livelihoods. To ensure the sustainability of this vital resource, it is essential to understand the regional water cycle, and accurate estimation of groundwater recharge has long been one of the key challenges in achieving this goal.

Research Method

The study developed a three-dimensional groundwater flow model based on hydrogeological field data, including river systems and geological structures, and incorporated meteorological inputs such as precipitation and evapotranspiration to simulate groundwater recharge. An interactive approach between observation and modeling was adopted, integrating iterative field investigations and model refinements. Observational data, such as spring distribution, were used as validation indicators to continuously refine the model's accuracy.



Three-dimensional groundwater flow model developed through the study

This high-resolution image has been posted on <https://www.suntory.com/news/index.html>

Research Findings

The study established a method to enhance the accuracy of groundwater recharge estimation through an interactive observation-modeling approach. It also revealed that infiltration processes and the amount of water stored underground vary depending on geological characteristics. In particular, elongated zones of enhanced permeability — commonly referred to as lineaments — were found to exert a notable influence on local recharge processes.

Future Outlook

Going forward, SIC will leverage these findings to deepen its understanding of the water cycle and further advance water source conservation initiatives — one of Suntory Group's key environmental goals — to achieve water sustainability.



Study area - Suntory Natural Water Sanctuary Minami Alps and its surrounding areas

This high-resolution image has been posted on <https://www.suntory.com/news/index.html>

As an organization responsible for research and technology development aimed at enhancing the value of Suntory Group and driving business growth, SIC will continue to pursue cutting-edge technologies and advance natural sciences in its ongoing quest to create new value for customers.

Find more about Suntory Global Innovation Center [here](#), and follow the latest updates on [LinkedIn](#).

^{*1} Groundwater recharge refers to the amount of water that infiltrates into the ground from sources such as rainfall and river water, and becomes stored as groundwater.

^{*2} The study of the water cycle in nature, including rain, snow, ice, surface water, groundwater, water quality, and water resources.

About Suntory Group

As a global leader in the beverage industry, Suntory Group aims to inspire the brilliance of life, by creating rich experiences for people, in harmony with nature. Sustained by the gifts of nature and water, the Group offers a uniquely diverse portfolio of products, from award-winning Japanese whiskies Yamazaki and Hibiki, iconic American whiskies Jim Beam and Maker's Mark, canned ready-to-drink -196 (minus one-nine-six), The Premium Malt's beer, Japanese wine Tomi, and the world-famous Château Lagrange. Its brand collection also includes non-alcoholic favorites Orangina, Lucozade, Oasis, BOSS coffee, Suntory Tennensui water, TEA+ Oolong Tea, and V energy drink, as well as popular health and wellness product Sesamin EX.

Founded as a family-owned business in 1899 in Osaka, Japan, Suntory Group has grown into a global company operating throughout the Americas, Europe, Africa, Asia and Oceania, with an annual revenue (excluding excise taxes) of \$20.3 billion in 2024. Its 41,357 employees worldwide draw upon the unique blend of Japanese artisanship and global tastes to explore new product categories and markets.

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