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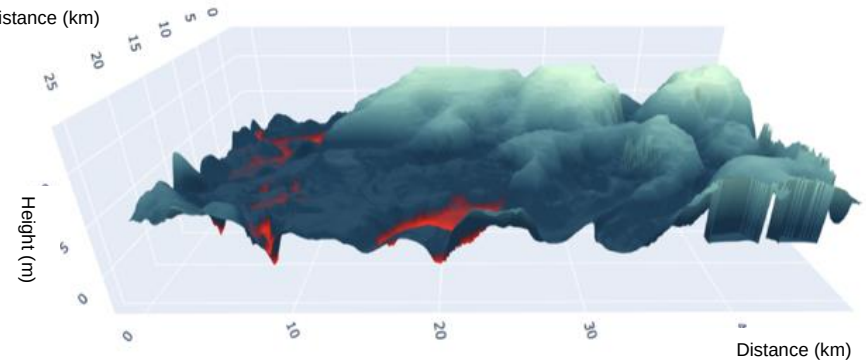
For Immediate Release

Sumitomo Forestry Co., Ltd.
IHI Corporation
Recursive Inc.

Establishment of AI Model for Tropical Peatland Management by NeXT FOREST

—Contributing to global CO2 reduction using groundwater level forecasting—

NeXT FOREST Corporation (Headquarters: Tokyo; hereinafter, NeXT FOREST)*1, a joint venture of Sumitomo Forestry Co., Ltd. (President and Representative Director: Toshiro Mitsuyoshi; headquarters: Tokyo; hereinafter, Sumitomo Forestry) and IHI Corporation (Representative Director, President and Chief Executive Officer: Hiroshi Ide; headquarters: Tokyo; hereinafter, IHI), has established an initial stage AI model (AI hydrologic model) for tropical peatland management*2 through a partnership with AI startup Recursive Inc. (Co-founder and CEO: Tiago Ramalho; headquarters: Tokyo; hereinafter, Recursive). This will enable groundwater level forecasts created by Sumitomo Forestry's team of highly experienced engineers to be carried out using AI. NeXT FOREST will utilize this AI to help control CO2 emissions and wild fires in tropical peatlands in Indonesia and other parts of the world.



3D topographical map based on groundwater level forecasting using AI

■Background to Development

Sumitomo Forestry and IHI are in the process of developing a hydrologic model*3 that runs simulations based on various data points including rainfall amount, vegetation transpiration, elevation, slope, and weather, in order to control the groundwater level vital to tropical peatland management. This hydrologic model requires a great deal of time to obtain various data and analyze it. At the same time, in addition to development of this hydrologic model, the two companies are working to utilize AI for the development of groundwater level management technology at an early stage in response to the urgent issues of climate change countermeasures and biodiversity conservation.

Recursive, established in Japan in 2020 by Tiago Ramalho, formerly a senior researcher at DeepMind Technologies, an AI development company under the umbrella of Alphabet Inc., the holding company of Google, is collaborating with development.

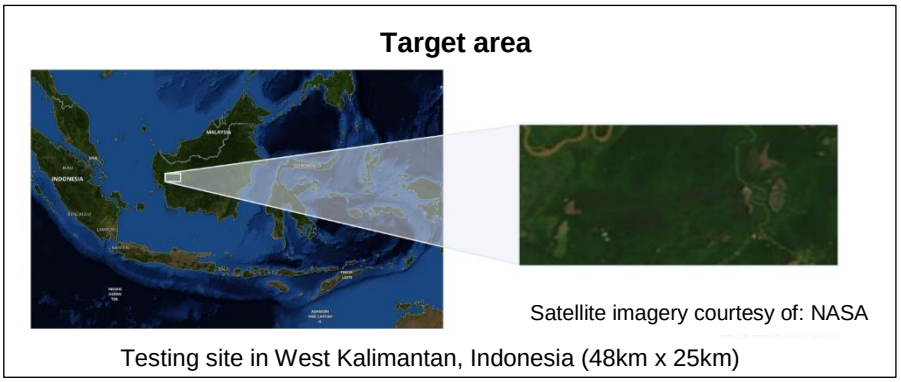
This proprietary AI model combines AI-driven machine learning and physical model*4 using groundwater level data obtained from more than 10 years' worth of measurements taken by Sumitomo Forestry in the tropical peatland it manages in Indonesia as training data*5.

Specifically, the AI model is now able to forecast groundwater levels for the entire target area up to seven days in advance using a topographical map as well as actual groundwater level and rainfall amount readings at physical observation points.

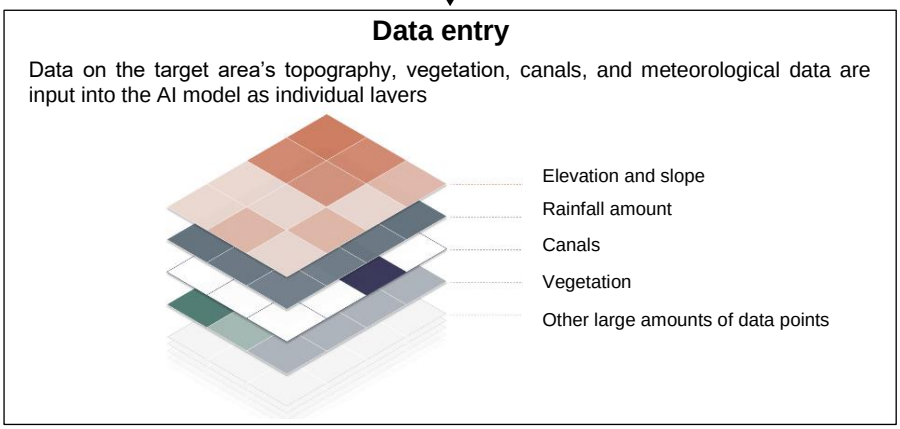
The AI model will be updated going forward so that simulations can be run by forestry companies and others to determine best practices in waterway management and dam placement to ensure that the peatland that they manage maintains the appropriate groundwater level based on the forecasts.

*1 Established in February 2023 to provide consulting services for the responsible management of tropical peatland.
*2 Land consisting of peat deposits which are formed plant debris not decompose in water. When the groundwater level drops and peatland dry out, the peatland can be lost and emit large amount of CO2 by forest fires or peat decomposition. As such, groundwater level management is critical.
*3 A physical model using the principles of hydrology used to reproduce the circulation of water in nature, such as water flow.
*4 Correct data used when teaching AI the machine learning model.
*5 Diagrams that represent an object using a detailed expression close to its physical substance, such as specifications and blueprints.

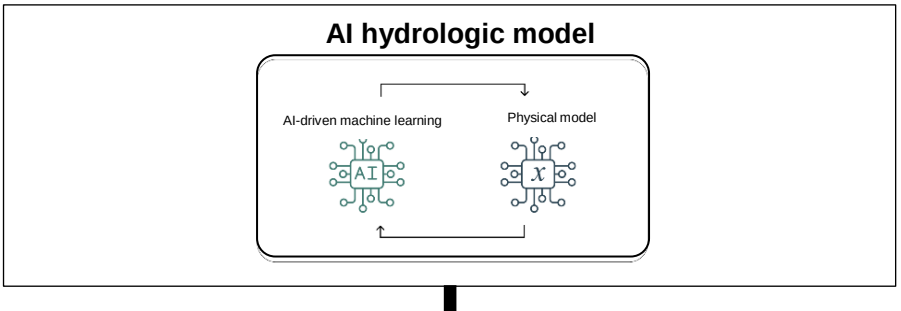
Workflow of AI hydrologic model and sample image of groundwater level forecast



Utilizes more than a decade's worth of data from Sumitomo Forestry's forestry business in West Kalimantan, Indonesia

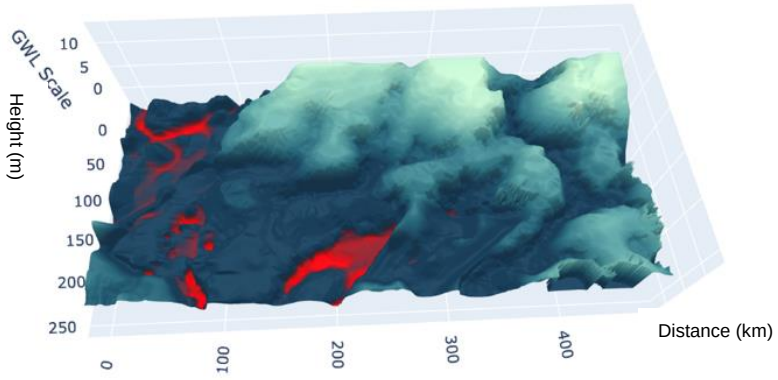


Inputs topographical data including elevation and slope, rainfall amount, canals and other data points into the AI model



AI hydrologic model, which combines AI-driven machine learning and physical model using groundwater level data as training data, forecasts groundwater several days in advance

3D topographical map generated by AI based on the groundwater level forecast for three days into the future



The red zone indicates areas where the groundwater level is forecast to be below the standard threshold.

Issues alert when the groundwater level forecast by AI for several days later poses a higher risk of fire

■Background of Project

Tropical peatland contains vast amounts of water and carbon. It is made up of deposits of organic matter formed by withered plants that do not undergo decomposition by microorganisms in the soil. Globally, tropical peatland covers an area of more than 82 million hectares (about twice the size of Japan), distributed mainly in Indonesia, the Congo Basin, and the Amazon. This land stores at least 89 billion tons of carbon (about 10 times the world's carbon emissions in 2017).

The indiscriminate destruction of tropical peatland due to harvesting or swidden agriculture will release vast amounts of carbon dioxide into the atmosphere following the decomposition of organic matter contained in the ground. In addition, this will result in a loss of major flows of water where rainwater is stored in the ground and returned to the air through transpiration, causing drought, flooding or other extreme weather.

Tropical peatland requires the right groundwater level to thrive. If this level declines, the peatland will dry out and become extremely flammable, which can lead to wild fires. In contrast, if this level is too high, it will inhibit the growth of trees. This is why groundwater level in tropical peatland must be continuously adjusted to maintain the right level.

Sumitomo Forestry and IHI believe that the conservation and appropriate management of tropical peatland represents a critical issue for achieving carbon neutrality and stabilizing the foundation for human survival, such as the conservation of biodiversity and the water cycle. The two companies are developing consulting services to disseminate tropical peatland management technology to the world by combining the high-precision ground observation system for tropical peatlands built by Sumitomo Forestry with IHI's technology using drone and satellite data and weather observation and prediction technology cultivated in the aerospace sector.

The Sumitomo Forestry Group engages in a number of businesses globally focused on wood, from forest management to the manufacture and distribution of timber and building materials, contracting of detached house and medium- to large-scale wooden constructions, real estate development, and wood biomass power generation. Under its Long-Term Vision called Mission TREEING 2030, Sumitomo Forestry aims to contribute to the decarbonization of not only the company but also society as a whole by increasing the amount of CO2 absorbed by forests and storing carbon over the long term through the spread of wooden constructions by implementing the Wood Cycle, which refers to Sumitomo Forestry's value chain.

In order to "accelerate the cyclical forestry business" set out in its Long-Term Vision, Sumitomo Forestry will establish a forestry fund on a global scale and expand forest area.

IHI will grow this business into a highly sustainable one that coexists with nature while simultaneously working to realize a decarbonized, circular society and disaster prevention/mitigation as a solution to global issues to protect our beautiful planet. In addition, by providing engineering services that combine various solutions, it will contribute to the realization of carbon neutrality by 2050.

Recursive is a service provider offering AI solutions to build a sustainable future. The company provides AI system development and consulting services that combine its knowledge of a wide range of industries, including the environment, energy, healthcare, pharmaceuticals, food, and retail, with advanced technological capabilities and expertise in the business of sustainability. In order to leave a better global environment and society to future generations, Recursive's unrivaled professionals will lead the creation of a new society with world-class technology.

■Project Logo

<Related Press Releases>

■*Sumitomo Forestry and IHI Enter Business Alliance for Tropical Peatland Consulting and High-quality Carbon Credits*
Sumitomo Forestry: https://sfc.jp/english/news/pdf/20210618_01.pdfIHI:
https://www.ihi.co.jp/en/all_news/2021/aeroengine_space_defense/1197487_3366.html

■*Sumitomo Forestry and IHI Establish Tropical Peatland Consulting Joint Venture*
Sumitomo Forestry: https://sfc.jp/english/news/pdf/20230214_02.pdf
IHI: https://www.ihi.co.jp/ihi/all_news/2022/aeroengine_space_defense/1198192_3479.html