

Traverse, modular system, and drill camp operations for CASCA clean hot water drill

Since 2016, the Korea Polar Research Institute (KOPRI) has operated a tractor traverse system designed to transport scientific personnel, research equipment, and supplies from Jang Bogo Station to the interior of the Antarctic Plateau, enabling round-trip traverses of up to 1,500 km. In 2020, KOPRI launched the Clean Access to Subglacial lake Cheongsuk in Antarctica (CASCA) project, aiming to cleanly access Subglacial Lake Cheongsuk beneath David Glacier, East Antarctica. The CASCA mission targets drilling through ~2,300 m of glacial ice to reach a 50–80 m deep freshwater column within the subglacial lake, using clean hot water drilling (CHWD) technology. To support this effort, KOPRI has developed a containerised, modular CHWD system mounted on sleds, adapted from the CHWD platform originally designed by the British Antarctic Survey (BAS) for the Subglacial Lake CECs (SLC) project. This sled-mounted modular system enhances operational reliability, scalability, and transportability. It allows for efficient deployment, reduced manual handling, a flexible drill camp layout, and a minimized environmental footprint. These integrated developments represent a significant step forward in KOPRI's capability to undertake clean subglacial access missions not only for the upcoming CHWD at Subglacial Lake Cheongsuk, but also for future clean access efforts in the Antarctic Plateau.

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