



*The freed weather station. Dan Miller estimates the "ice cube" weighed 1,000 kg when they pulled it from the lake. Photo by L.Hinzman.*

## **ICE, ICE BABY**

"When you're trying to keep a project running," says WERC's Ken Irving, "expect the unexpected." On a field site in the Arctic, anything can happen; a bear might eat your data logger, or a stormy gale might capsize your meteorological station.

The intrepid research staff of WERC specializes in keeping projects running, and this year a long-term project is still on course, thanks to their work.

Beginning in the summer of 2001, INE researchers installed a set of instruments in a few lakes on the Alaskan coastal plain to monitor the impacts of winter water withdrawal in these areas.

Water is commonly withdrawn from these northern freshwater sources to create the ice roads used for oil exploration, and some environmentalists wonder how this withdrawal might affect the lakes' hydrology, chemistry, and/or biology. INE researchers are remotely monitoring a few lake variables (including water temperature and water pressure) each season, via a floating station. A data logger installed at the site records hourly readings for all parameters, and a radio telemetry system transmits the data back to UAF in Fairbanks. Once a station is installed, researchers generally visit the site only a few times a year.

The "ice cube" (pictured above) is a result of one of these remote systems overturning. Meteorological data from other nearby stations indicated a high wind event (average wind speed near 30mph) was taking place when WERC lost telemetry with the station. Researchers believe this wind event, coupled with heavy icing on the station's solar panels, caused the floating system to overturn. One of these remote monitoring stations costs around \$25,000, and the data it transmits back to Fairbanks is essential to this project (funded by the US Department of Energy, BP, and Conoco Phillips).

After another researcher spotted the capsized station in early October, PI Larry Hinzman put together a rescue team to get the data flowing again. A reconnaissance trip in November, when the air temperature was -30F, proved that several days and a substantial shelter would be necessary to resurrect the station.

The recovery trip occurred in February, 2004. Team members included Dan Miller, Larry Hinzman, and Ken Irving from the Water & Environmental Research Center, along with Michael Lilly and Loda Griffeth from GW Scientific (a local engineering firm).

The team devised a plan to clear the ice away from the station, then create enough motion to flip it back upright. They used chainsaws to cut 2.5 foot vertical trenches in the ice around the raft, and also around where they expected the station's tall central mast might arise. These trenches, enlarged further by hand with ice axes and steady chipping, intentionally did not yet break through the ice to the lake water below. The team also secured heavy straps to the station's structural frame, then attached this rigging to a large track vehicle known as a Tucker.

Then they cut away the remaining 1.0 -1.5 feet of ice; the water, confined by the lake's remaining ice cover, rose up in the gap. The station became buoyant (luckily, the floats were not damaged in the capsizing), and a slight tug by the Tucker righted the raft. Then the rescue team heaved a collective sigh of relief, warming air currents all the way to Barrow.

All this activity occurred in a 800 square foot Weatherport shelter (see front page), mobilized and erected on site, with a kerosene heater and electrical generator controlling the environment.

Next the team towed the station to the nearest road by Tucker. In the extreme cold temperatures, every water-logged box froze, encasing data loggers and batteries in ice. Finally, the station was transported by truck to a Conoco warehouse for a thorough thaw. Ice-free inspection revealed some slight damage, including a bent transmission antenna and a few battered struts. With a few repairs, the station is ready for use on a new lake this winter; the repaired station will be re-launched October 2004.

*Thanks to Dan Miller and Ken Irving for contributing this story. For more information about this project, contact [Dr. Larry Hinzman](mailto:Dr.Larry.Hinzman).*



*The weather station, minus several layers of ice. Note the remaining ice buildup in the instrument box. Photo by L. Hinzman.*