North Slope Lakes Project

Water and Environmental Research Center
University of Alaska Fairbanks

Mine Site B (6 Mile Lake) Water-Level Observations

North Slope Lakes Project Hydrologic Notes, May 23, 2006.

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Water level elevations are being surveyed at Mine Site B (6 Mile Lake), in both the south and north cells during winter months. Additional chemistry and physical measurement data are also being collected. Water withdrawals took place during the winter in just the North Cell. Hydrologic interactions between the two cells and effects of water withdraw are some of the primary issues under investigation.

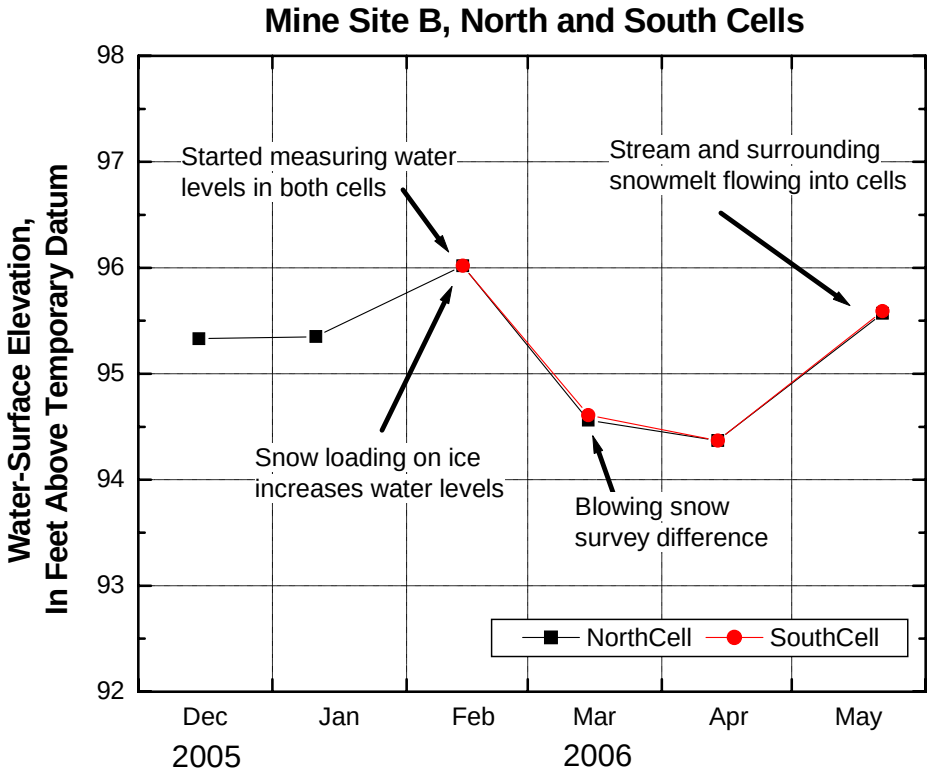

Figure 1. Water-surface elevation (temporary datum) in Mine Site B north and south cells. During winter ice-covered periods, this is the water surface in open drill holes. The water levels in both cells were the same through the winter period and there was water under ice at either side of the island separating the two cells.

Initially, water levels were surveyed just in the North cell. Ice holes were augered in the two channels connecting the north and south cells and both channels had open-water connections throughout the winter period. The average ice thickness during the May sampling was around 4.5 feet. The data from this winter season shows the impact of snow loading by the increase in water levels in February. Some of the decrease in water levels from February to March can be accounted for by overflow water seeping onto the top of the ice surface and refreezing. Water levels declined during March and April with regular water use. Additional snow loading during these months will have a slight impact on the relationships between water withdrawal volumes and winter water levels. During the May sampling visit, local snowmelt had been entering the North cell for about a week. Due to dusting from adjacent roads and pads, this melting should always occur earlier than the regular melting of undisturbed tundra. Early snowmelt from Milne Creek was also flowing into the South reservoir, probably for about a week. Flow rates are estimated to be over 100 gallons per minute. The resulting water levels in the North and South cells are now higher than in December 2005.

The water level data and other winter observations indicate the two cells were hydrologically connected throughout the winter season in both of the channels connecting the two cells. Water management applications include the separate permitting of the North and South cells, the timing of water use permit start and end dates, and reservoir maintenance activities that may yield more usable volumes from the two cells. Dissolved oxygen levels remained high in the most of the water column for both cells. Further interpretation will be covered in future project reports and papers.

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