

WISSARD FIELD REPORT: 27 January 2013. Compiled by John Priscu.

WISSARD Science Personnel at SLW: Slawek Tulaczyk, Matthew Siegfried, Dan Sampson, Brent Christner, Grace Barcheck, John Priscu, Ross Powell, Alberto Behar, Jill Mikucki, Tristy Vick, Amanda Achberger, Andy Mitchell, Reed Scherer, Tim Hodson, Mike Osment Alex Michaud, Carlo Barbante, Mark Skidmore, Ken Mankoff, Jason Thomas, Doug Fox

WISSARD Drillers at SLW: Dar Gibson, Darin Blythe, Graham Roberts, Dennis Duling, Justin Burnett, Jeff Lemery, Robin Bolsey,

Camp Update:

- Drilling continued on 25 and 26 January. The drill encoder indicated a depth of 796 m in the early hours of 26 January. The drill was left at this depth for several hours to enlarge borehole diameter in this region. The drill was then pulled from the hole at about 0400 h (26 January) and the mothership team began preparing to deploy this tool to provide a live video feed of the borehole to the surface. The mothership was deployed at 0555 h (26 January) with the borehole return pump and power cable still in the borehole, which posed an obstacle to deployment. The drillers adjusted the return pump lines and the mothership was successfully deployed at 0805 h. The tool was lowered at a rate of 10 to 20 m/minute. As the mothership camera reached 690 m we observed that the latest drill deployment formed a deviation from the main borehole. It was clear that this situation would compromise deployment of borehole science tools so we decided to melt in this region for several hours, hoping that this would coalesce the two holes (melt the two holes together). Borehole water level sensor revealed that the lake has not been penetrated. Reaming in the region near 690 m continued throughout the day and the mothership was again deployed at ~1700 h on 26 January and revealed that the deviation remained at ~ 690 m. The drill was lowered once again to ream the borehole below 690 m and continue deepening of the hole. At 0804 h on 27 January the water level in the borehole rose rapidly from 110 m to about 80 m, with the latter being the estimated equilibrium water head in the lake based on available ice and firn thickness data. At the same time, the load cell showed a drop of 100 pounds. Both real-time sensor readings are consistent with connecting the borehole to Subglacial Lake Whillans. Initial estimates imply that the ice is 801 m thick above the lake, which agrees very well with the prior estimate based on seismic imaging (802m) published by Horgan et al. (2011). The drillers will continue to ream the hole throughout the day. We plan to deploy the mothership on the evening of 27 January to verify that the lake was penetrated, determine if the borehole diameter is appropriate for tool deployment, measure the thickness of the ice over the lake, and measure the depth of the lake.
- Our local broadband seismic station did not detect any ice deformation during the period of breakthrough.
- The borehole science teams are preparing instruments to retrieve water and sediment samples and data sensors, and borehole tools to collect longer-term data above the lake.
- We are working with ASC to prioritize PAX and cargo for possible flights to SLW next week



Figure. Load cell and water level data from drill sensors indicating possible lake entry at 0802 h, 27 January 2013. The vertical white line reveals the temporal region when sensors changed.