IceCube Project Monthly Report
December 2005

Accomplishments

The IceCube drill crew completed four holes as of January 13th. The locations of the four holes are 29, 39, 38, and 30. The drilling start dates for each hole were December 19th, January 1st, January 5th, and January 10th respectively (South Pole dates).

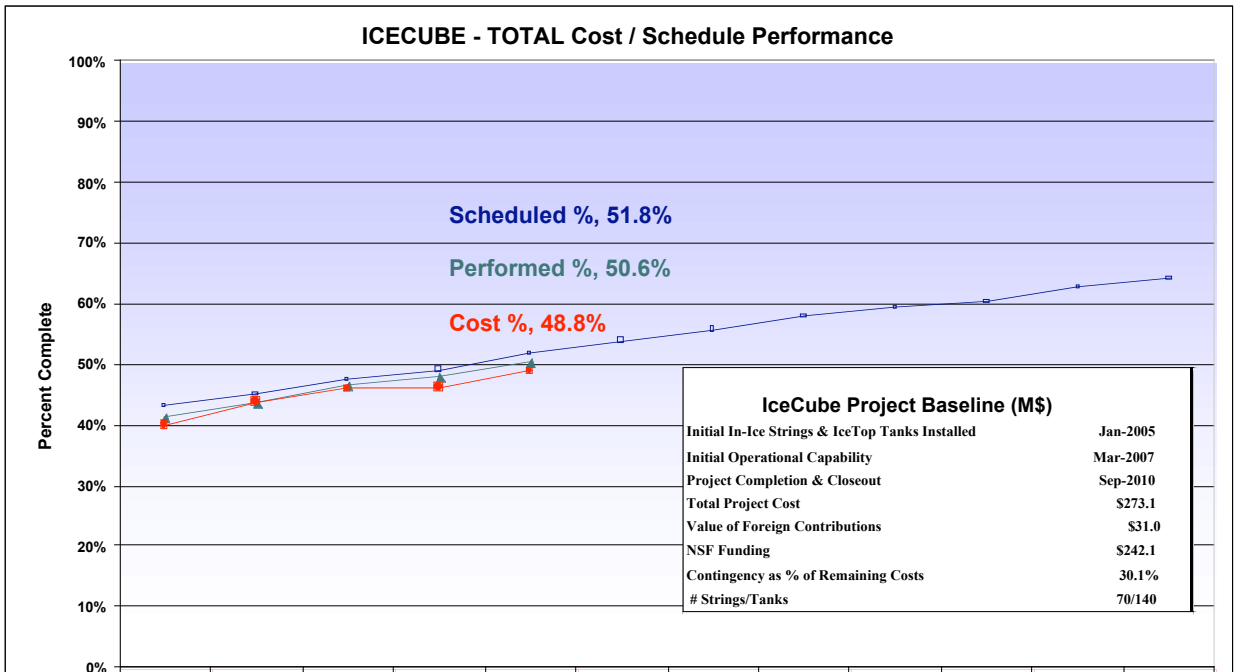
The installation of the string at location #29, the first string of the season, was successfully completed on the morning of December 26th after a twelve-hour deployment period. String 39 and 38 were both deployed in roughly an equivalent amount of time. Deployment of string #30 is currently underway.

After a delay of a few weeks in the arrival on station of the final surface cables, all twelve surface cables planned for this year are now in place in subsurface trenches and connected to junction boxes on the surface.

The twenty-four IceTop tanks, two tanks at each of the twelve locations, are positioned with all forty-eight DOMs installed. The tanks are filled with water and a controlled freeze is underway.

On-ice Digital Optical Module (DOM) testing is complete. The initial pass rate was greater than ninety-seven percent. Some "failed" DOMs will likely pass after additional testing and analysis.

Lower level commissioning tests of strings 29, 39, and 38 are underway and preliminary results are positive. Communication has been established with each string.



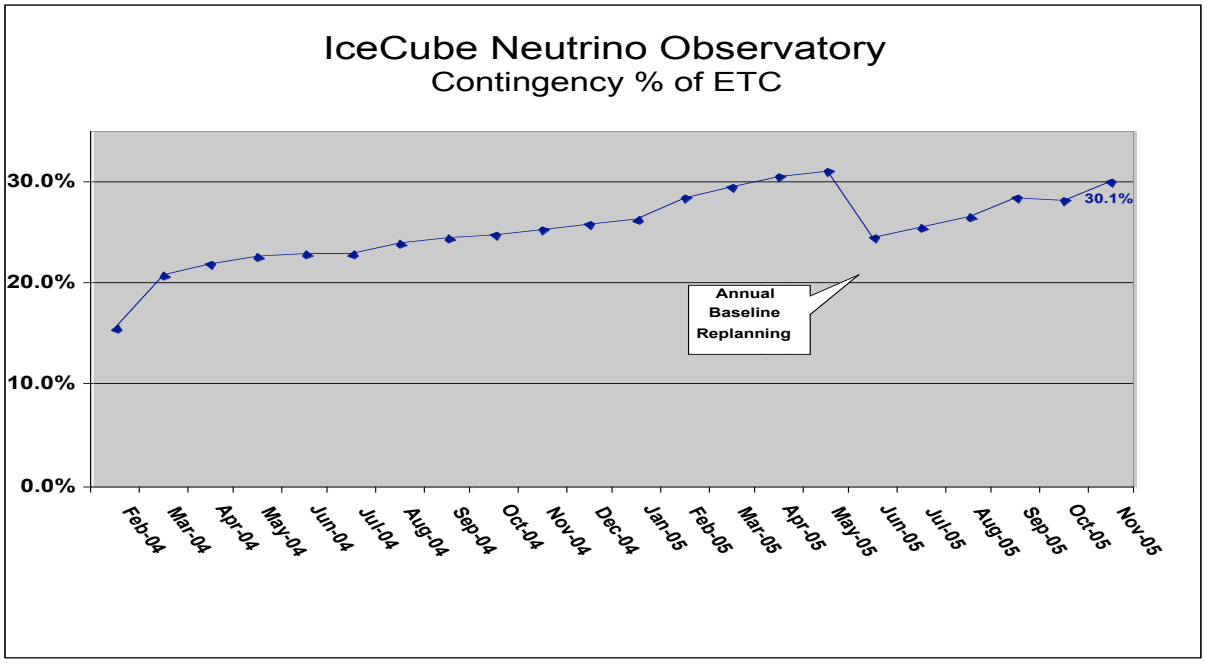
	J-05	A-05	FY05	O-05	N-05	D-05	J-06	F-06	M-06	A-06	M-06	J-06
Scheduled %	43.1%	44.9%	47.4%	49.1%	51.8%	53.8%	55.7%	58.0%	59.3%	60.4%	62.7%	64.2%
Performed %	41.4%	43.7%	46.6%	48.0%	50.6%							
Cost %	40.0%	43.7%	45.8%	46.2%	48.8%							

Cost and Schedule Performance – The project is roughly 50.6% complete versus the planned performance of 51.8% complete as measured using earned value techniques. The earned value measurement includes all tasks completed to date including design, development, procured materials, and the construction of the infrastructure that supports the current seasonal installation plan, e.g., the hot water drill, cargo shipments, etc. The cost and schedule status report and total contingency percentage (contingency/cost-to-complete) as a function of time, currently roughly 30%, is shown in the following tables.

IceCube Neutrino Observatory
Cost Schedule Status Report
Reporting Period Ending: 11/30/2005 [1]

	Cumulative To Date (AY K$)					At Completion (AY K$)			Complete (%)		
	Budgeted Cost [2]		Actual Cost	Variance							
OBS Structure L2	Work Scheduled	Work Performed	of Work Performed	Schedule	Cost	Budgeted AY $s	Latest Revised Estimate	Variance	Scheduled	Performed	Actual
PROJECT SUPPORT	15919.5	15919.9	16345.3	0.4	-425.5	29904.8	30330.3	-425.5	53.2%	53.2%	54.7%
IMPLEMENTATION	19915.0	19739.1	19599.5	-175.9	139.6	32388.6	32249.0	139.6	61.5%	60.9%	60.5%
INSTRUMENTATION	34142.3	33592.4	32404.6	-549.9	1187.8	65432.7	64245.0	1187.8	52.2%	51.3%	49.5%
DATA ACQUISITION	20956.8	20560.3	21139.6	-396.5	-579.3	32864.6	33443.9	-579.3	63.8%	62.6%	64.3%
DATA SYSTEMS	11024.3	10431.5	10515.5	-592.8	-83.9	25017.6	25101.5	-83.9	44.1%	41.7%	42.0%
DETECTOR COMM. & VERIFICATION	7979.4	7855.7	7598.4	-123.8	257.3	18825.0	18567.7	257.3	42.4%	41.7%	40.4%
RPSC SUPPORT	12616.6	11587.5	7821.2	-1029.1	3766.3	31997.8	28231.6	3766.3	39.4%	36.2%	24.4%
NSF	512.9	512.9	512.9	0.0	0.0	1263.0	1263.0	0.0	40.6%	40.6%	40.6%
Sub Total	123067.0	120199.3	115937.1	-2867.7	4262.2	237694.2	233432.0	4262.2	51.8%	50.6%	48.8%
Management Reserve											
Total Contingency						35,359.1	39,621.4	4,262.2			
Items Outside of Approved Baseline											
IceCube Neutrino Observatory [2]	123,067.0	120,199.3	115,937.1	-2,867.7	4,262.2	273,053.3	273,053.3	0.0	51.8%	50.6%	48.8%

Notes: 1 Incorporates approved and currently pending baseline changes.
2 Total Budget at Completion includes non-US contributions $1,283K over the amount in the post Hartill III baseline.
3 The budgeted contingency is: 30.1% of the Budgeted cost of work remaining.



Drill Construction and Operation – Following completion of final preparation and readiness review activities the start of firn drilling for the first hole of 2005/2006 commenced on Monday, December 19, 2005, nine days later than the original plan. Firn drilling proceeded as expected. Ice drilling started a few days after firn drilling once several issues were resolved related to incorrect readouts from load cells and programming of the motor control drives in the tower operations structure (TOS-1). The second hole commenced on January 1, 2006, after longer than expected start-up and commissioning times for the second tower operations structure (TOS-2). The two towers are now commissioned and drilling will proceed in a "leap frog" manner for the duration of the season.

The firn holes are now drilled with a new firn drill head (one for each TOS) that reduces the time to drill through firn (~ 40 meters) to less than five hours. This is less than one half of the time it took to drill through the firn last season.

The IceCube drill crew completed four holes as of January 13th. The locations of the four holes are 29, 39, 38, and 30. The drilling start dates for each hole were December 19th, January 1st, January 5th, and January 10th respectively (South Pole dates). The drill crew is directed to take a day off after the completion of each hole in order to ensure proper rest prior to the start of the subsequent hole. Data on hole 39, the second hole of the season, is provided at the end of the report. The start of drilling on the fifth hole of the season is planned for January 15th.

Deployment – Deployment of the first string, #29, went extremely well. The string was installed to the target depth of 2450m in less than 10 hours. Deployment for string 29 breaks down as follows: 1 hour for startup; ~7 hours for the installation of 60 DOMs; ~1.5 hours for the final drop.

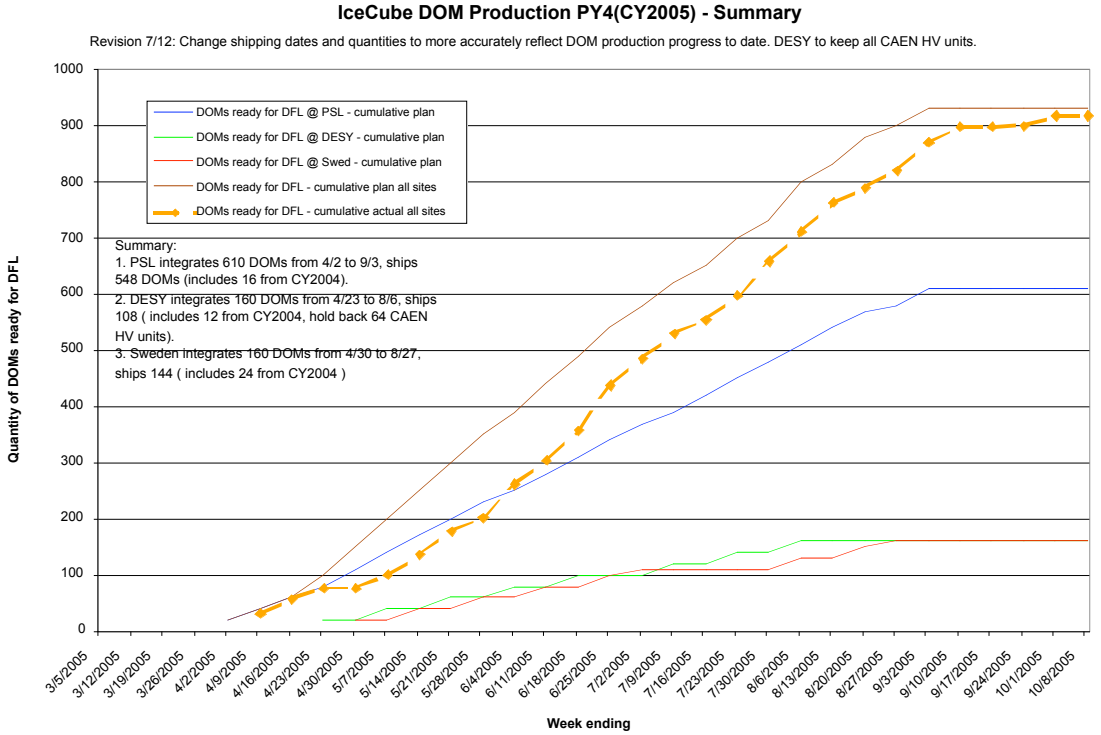
A logging run was performed on the second hole to determine the exact diameter of the hole after reaming. The pressure sensors on the cable delivered good data. The data was read out and displayed by the integrated drill/deployment readout system.

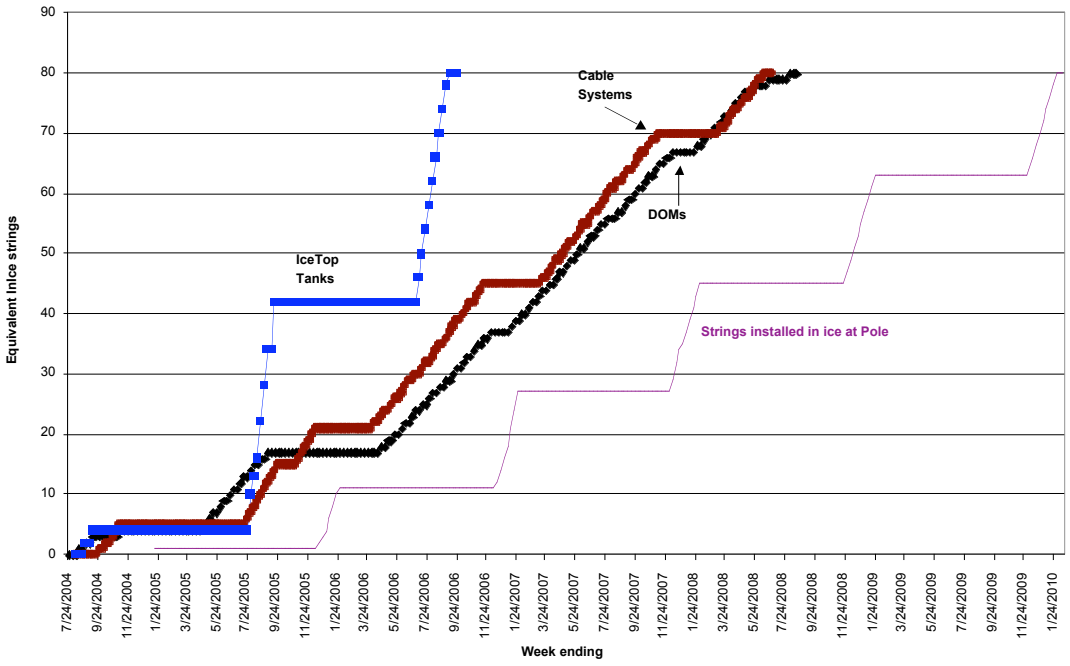
On January 4th the second string for the season was successfully deployed. Deployment for string 39 took approximately 14 hours from start to finish. Deployment for string 39 went as follows:

- January 3 at 2337 hours: start of string deployment
- January 3 at 2340 hours: first DOM installed
- January 4 at 1010 hours: last DOM installed
- January 4 at 1230 hours: depth of 2450m reached
- January 4 at 1302 hours: string is secured

Digital Optical Module and Cable Production Status and Plans - The status of DOM production for 2005 is provided in the chart below along with the plan for DOM, cable, and tank production plan for 2004 – 2008. There are no major issues with instrumentation production. The plans provide instrumentation well in advance of the installation need dates and support the use of the least expensive shipping methods.

A large number of cables will be stored at McMurdo station this winter and will be available for shipment to the South Pole at the beginning of next season. The project is looking at plans to off load surface cables at the beginning of next season, so called "drift" or "combat" off loading at the South Pole when temperatures do not permit aircraft to come to a complete stop. The production goals for 2005 were met resulting in 16 surface-DOM cables, 16 surface cables, and 930 DOMs.





Cargo Shipments to the South Pole – After a delay in getting the surface cables from Christ Church to McMurdo station, all the surface cables required this year arrived at the South Pole.

Final Acceptance Testing of DOMs – The DOM testing group passed 777 DOMs. There were 25 DOMs that failed initial testing due to high or unstable noise rates, low or high gain, flasher failures, and two with significant gel crazing. Many of the failed DOMs will ultimately pass final acceptance after further review and analysis.

String and IceTop Commissioning – All 76 IceCube DOMs installed at the South Pole last season are operating and reading data (60 DOMs on the string and 16 DOMs in eight surface tanks). Overall, the quality of the data from the first string and the eight IceTop tanks is very good. The basic strategy for string commissioning this season is to conduct detailed performance testing on only a few strings and a minimal set of tests on the rest of the strings. Communication tests on the first three strings deployed this season were successful.

Data Acquisition System - There is very good progress preparing the "final" data acquisition software. Modules of the software are now being uploaded onto the first string and surface computing hardware and the full software chain is being run on the South Pole System (SPS). A technical review of the DAQ system is planned for the spring 2006. The review will evaluate the results of the current season.

System Testing – The South Pole Test System, a mirror image of the South Pole System located at the UW-Madison Physics Department, continues to provide a critical test bed for the data acquisition and data handling software.

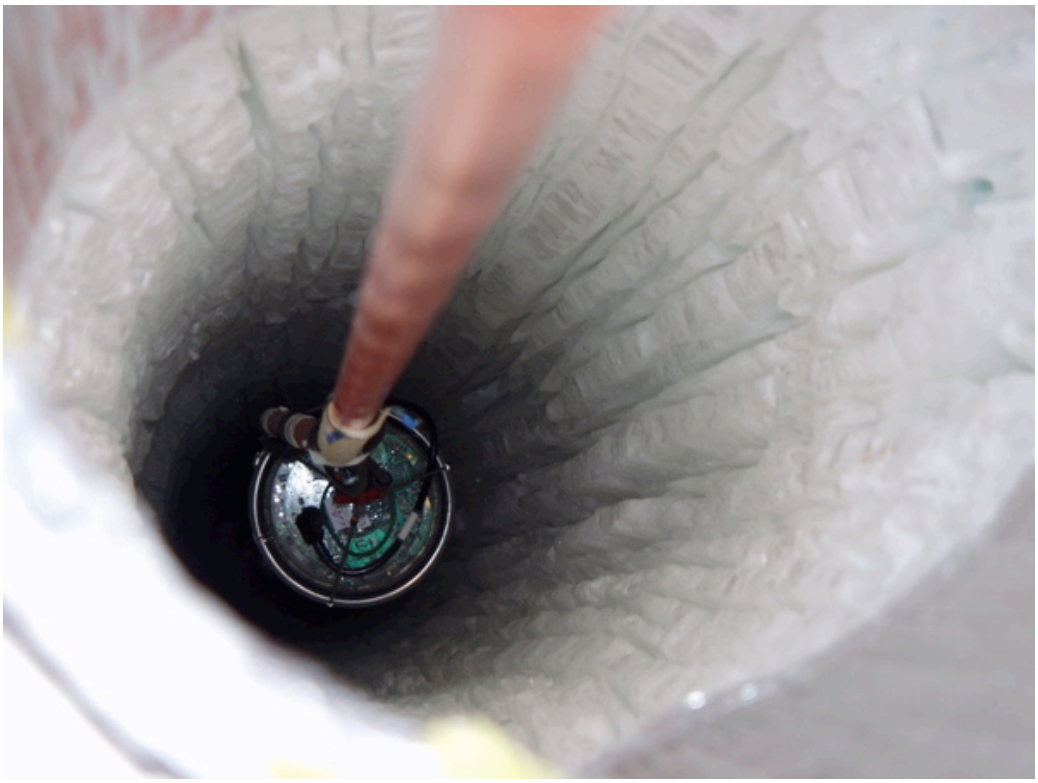
Data Systems – The temporary counting house is fully operational. The IceCube Laboratory or permanent counting house is expected to be available on December 15, 2006.

Quality Assurance & Safety – There are no significant quality assurance issues to report. Hank Leweling, IceCube Safety Manager on On-Ice Safety Officer during November and December left the pole on December 26th. Michael Zernick will be assume the On-Ice Safety Officer role beginning in mid-January and will remain at the South Pole for the rest of the season.

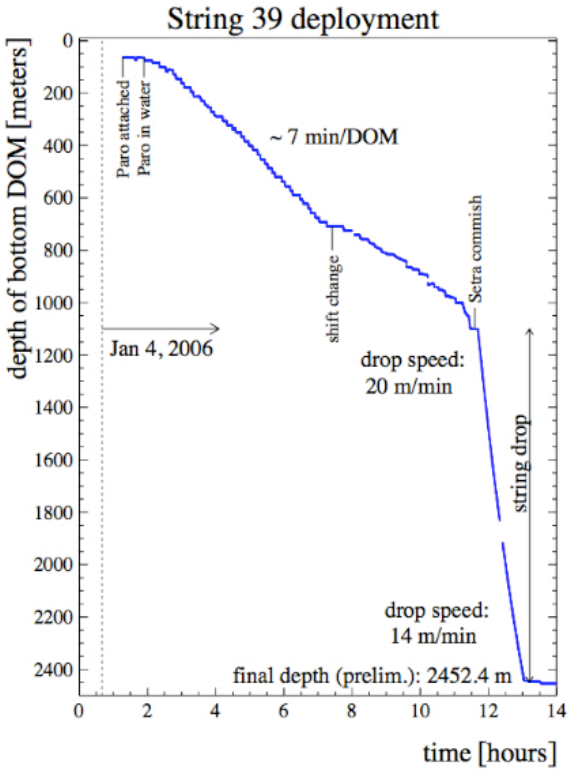
The monthly reports are posted at IceCube Monthly Reports. The IceCube 2005-2006 Weekly Construction Reports are posted at IceCube 2005-2006 Weekly Construction Reports.

Meetings and Events

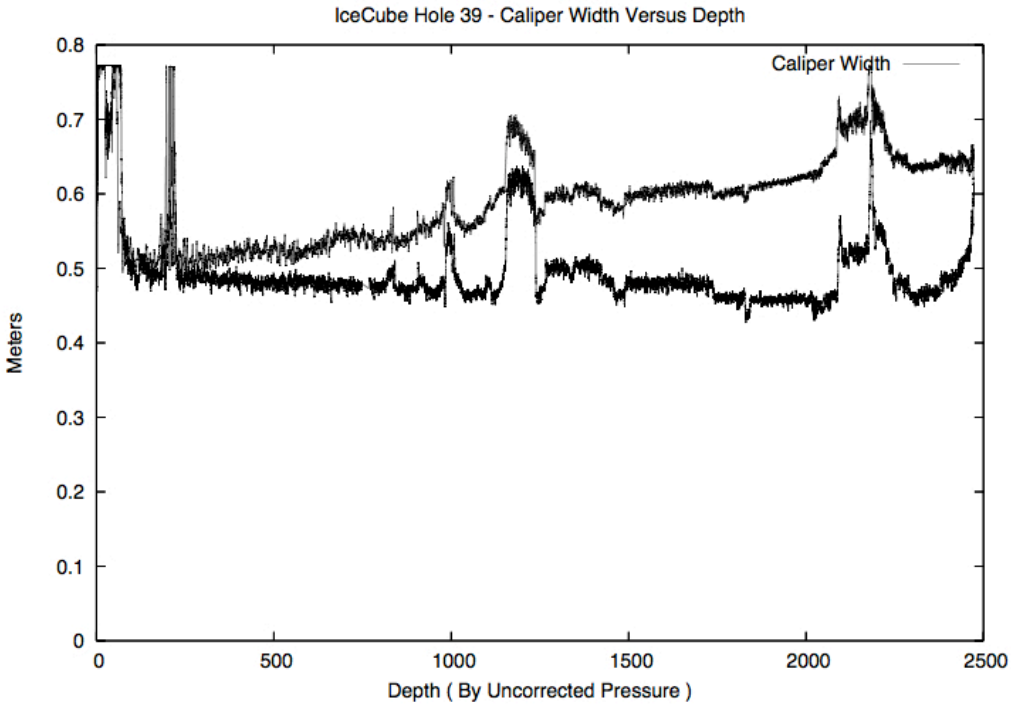
NSF Site Visit – Madison	February 23, 2006
Season Review Meeting w/ UW/RPSC/NSF	March 16-17, 2006
Drill Advisory Panel Meeting – Madision	March 27-28, 2006
Panel Advisory Panel Meeting – Madison	March 29-30, 2006
Science Advisory Committee Meeting – Madison	March 30-31, 2006
International Oversight & Finance Group – NSF	April 7, 2006
Collaboration Meeting - Baton Rouge, LA	April 10-14, 2006
NSF Annual Review - Madison	May 23- 25, 2006



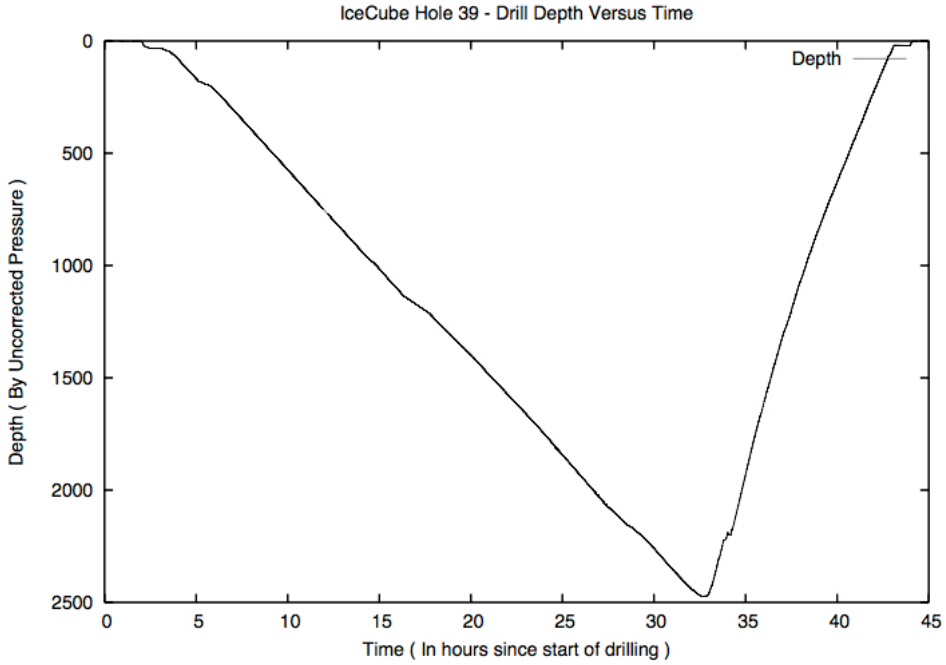
String 39 – January 4, 2006



String 39 Deployment Chart



String 39 Caliper Width vs. Depth Chart



String 39 Depth vs. Time Chart