

ITP66 Overview

Deployment Location: 8/27/2012, 23:53 UTC at 80° 12.7'N, 130° 2.3'W

Last Location: 8/24/2015, 23:01 UTC at 81° 46.78' N, 140° 60.00' E

Duration: 1092 days

Distance Traveled: 11,875 km

Number of profiles: 0 in 1 day

Other instruments: AOFB 27, IMB 2012-H, O-buoy 8, ITM2

ITP66 was deployed on a 1.55 m thick icefloe in the Beaufort Sea as part of the Beaufort Gyre Observing System (BGOS) during the JOIS 2012 cruise on the CCGS Louis S. St. Laurent. On the same icefloe, a Naval Postgraduate School Arctic Ocean Flux Buoy (AOFB 27), a US Army Cold Regions Research and Engineering Laboratory (CRREL) Ice Mass Balance Buoy (IMB 2012-H), an autonomous atmospheric chemistry buoy (O-Buoy 8) and an Ice-Tethered Micro (ITM 2) were also installed. The ITP included a prototype MAVS current sensor and SBE-37 microcat fixed at 6 m depth and was programmed to operating on a pattern profiling schedule, but only the microcat provided data after deployment.

ITP66 Deployment Operations

The morning that the second Ice-Based Observatory (IBO) during JOIS 2012 was deployed the region was characterized by mostly small ice floes with leads of open water everywhere, and air temperatures hovered just over freezing so creating scattered fog. Using the helicopter close to the ship, a floe which appeared to be somewhat larger and more robust than the surrounding ice was surveyed and found to be 1.5 m or more thick so sufficient for the ice station.

As in the previous ice station, numerous slingloads of instruments and equipment were flown onto the ice by helicopter for the buoy deployments and other sampling by other ice scientists. Using a 24" hydraulic auger rig, holes were drilled for the O-Buoy, AOFB, and ITP (to accommodate the extra diameter of the profiler due to the current meter sting and stabilizing fins). After the first hole was drilled, the O-buoy was lowered through the 2.0 m floe and its deployment team began mounting the superstructure. Then while the IMB was being deployed by a second group, a third group assembled and deployed the AOFB, followed by ITP 66, then ITM 2. As the cool damp day progressed, the wind picked up making for uncomfortable operations.

Unfortunately, the ITP deployment was delayed and difficulties were encountered reprogramming the profiler so that it required repowering and rebooting. It appeared that the profiler problem was solved when the unit was first mounted on the tether and queried over the inductive modem circuit, however after the mooring was fully deployed it did not respond, while

the microcat mounted on the tether did communicate over the same circuit. After 7 hours on the ice and deteriorating weather conditions, there was not sufficient time for a 3+ hour recovery of the profiler, so the ITP had to be left as it was with only the microcat providing seawater data.

ITP66 Data Description

The ITP profiler was configured to operate with a pattern profiling schedule, but communications between the underwater profiler and surface unit were never established after deployment. However, the microcat attached on the tether at 6 m was able to communicate hourly data successfully over the same inductive modem circuit for the entire 1092 day duration of the buoy. In the surface package, the GPS receiver was powered hourly to obtain locations, and buoy temperature and battery voltage status were recorded.

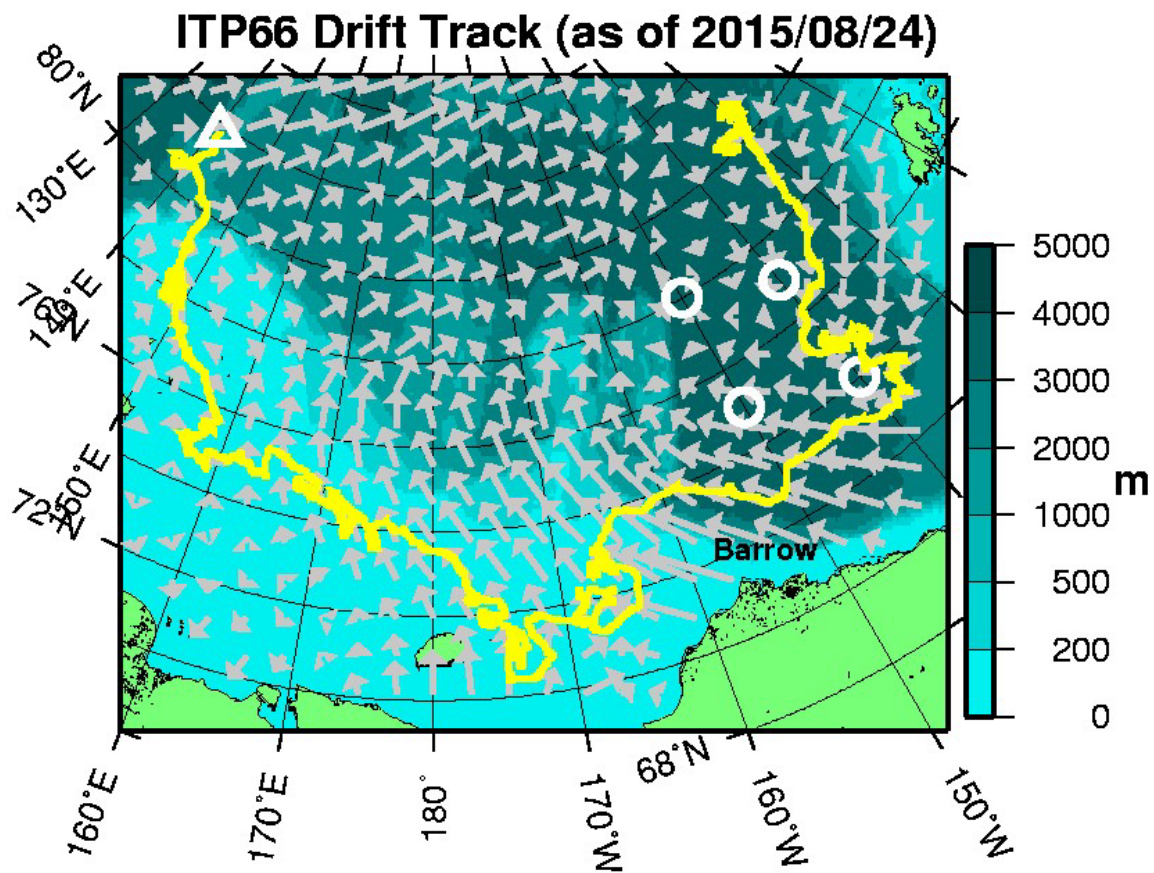
The ITP drifted generally in a large clockwise pattern southward along 135 W longitude for the first year, then westward out of the Canada Basin and over the Chuckchi and East Siberian shelves for the next 1.5 years, and finally northward to nearly 82° for the remainder of its 3 year drift until the surface package ceased Iridium transmissions.

The plots below are of the final location and status data from the surface package, and subsurface microcat data.

Level II hourly buoy location data in ASCII format: `itp66rawlocs.dat`

Microcat data in MATLAB format: `itp66final.mat`

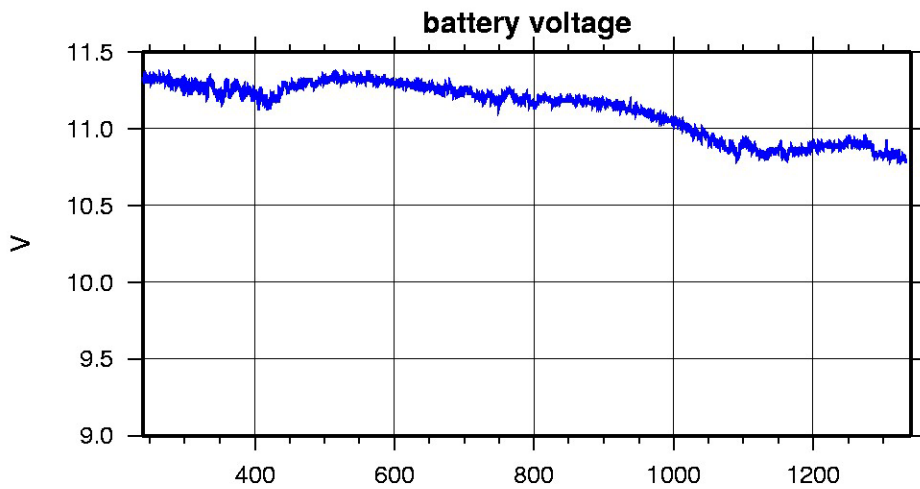
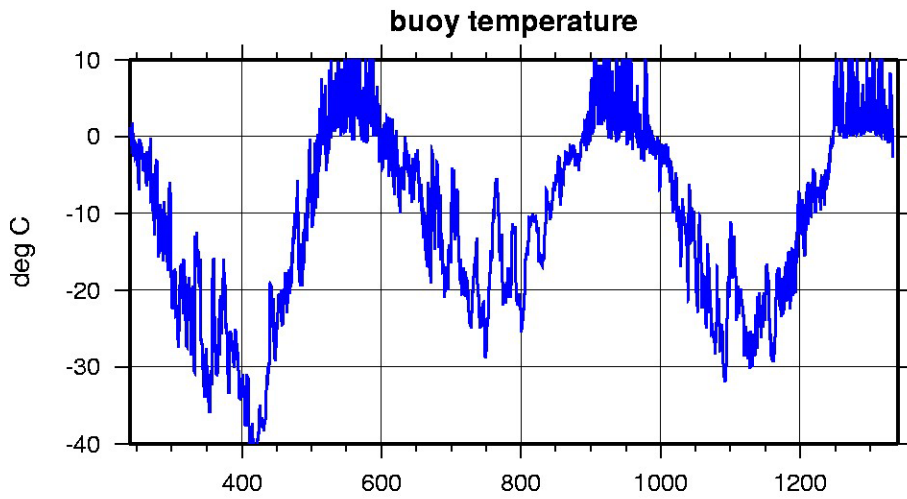
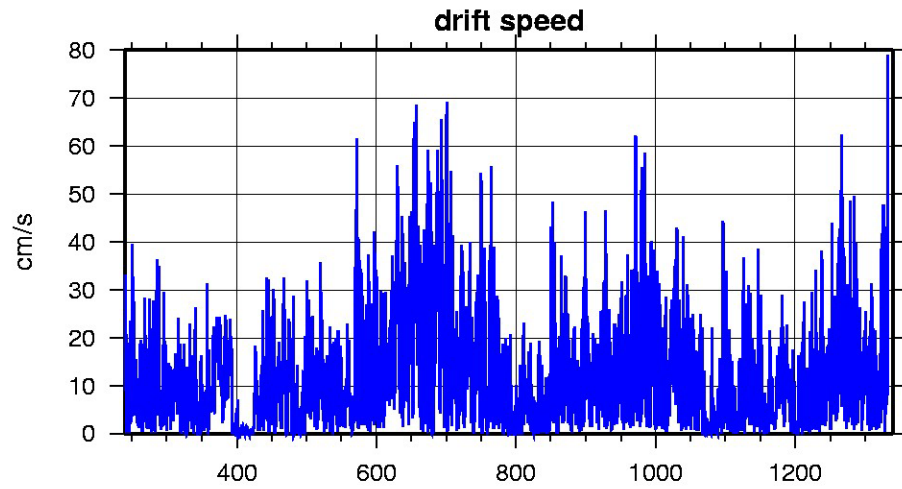
Microcat data in ASCII format: `itp66final.tar.Z` and `itp66final.zip`



**ITP drift (yellow line) and latest location (triangle),
BGOS moorings (white circles) and annual ice drift from
IABP (grey vectors) on IBCAO bathymetry (shading).**

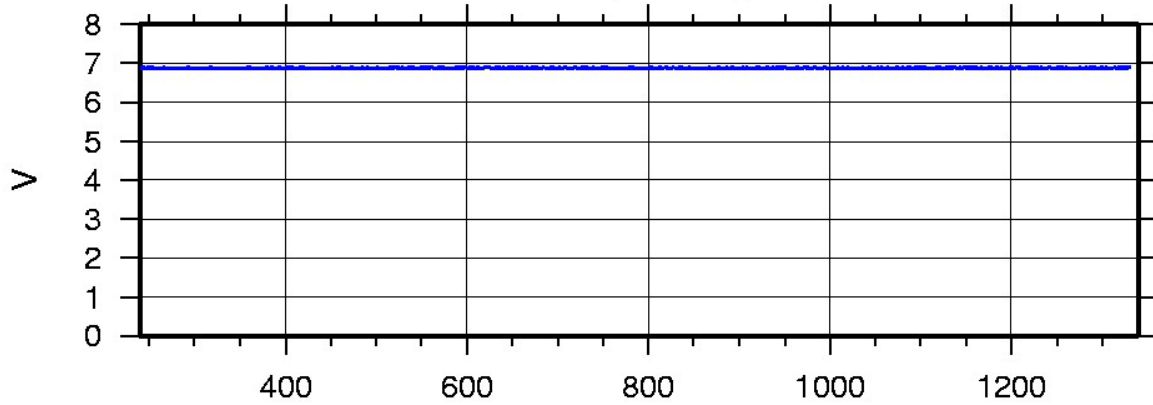
Plot of buoy locations

ITP66 Buoy Status (as of 2015/08/24)

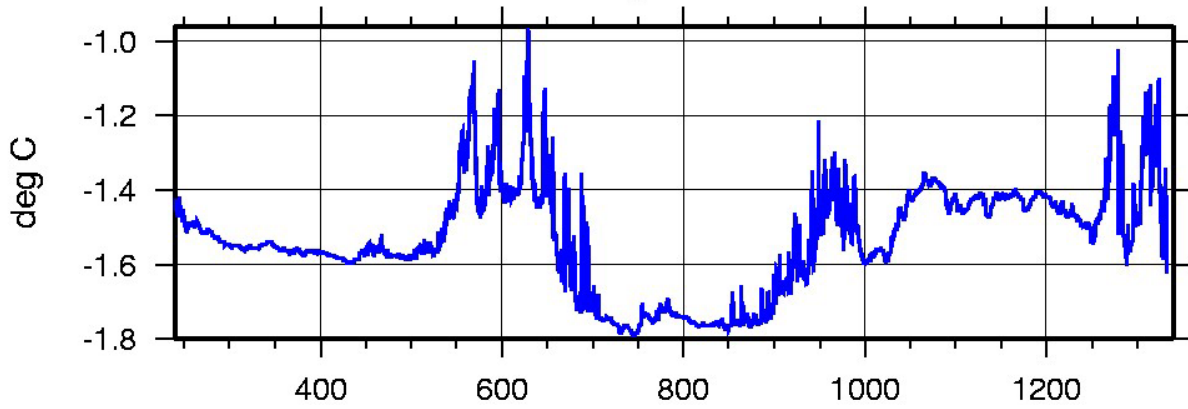


ITP66 Microcat (as of 2015/8/24)

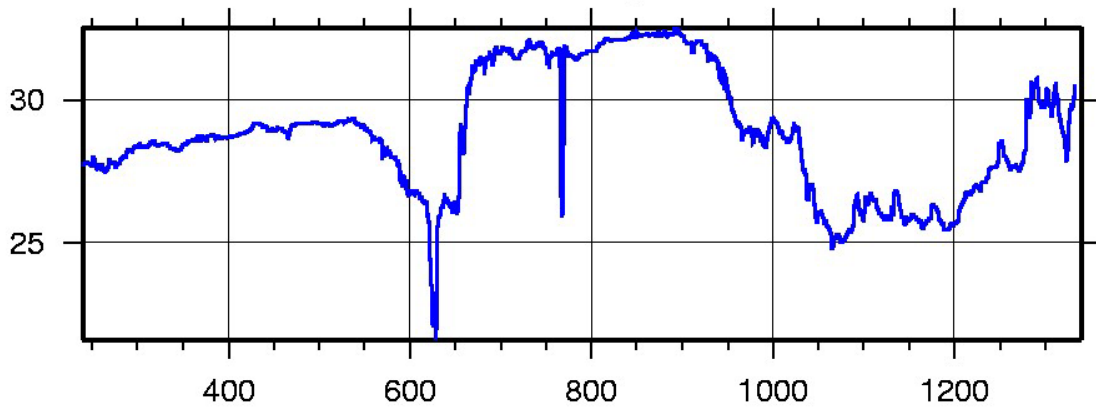
battery voltage



temperature



salinity

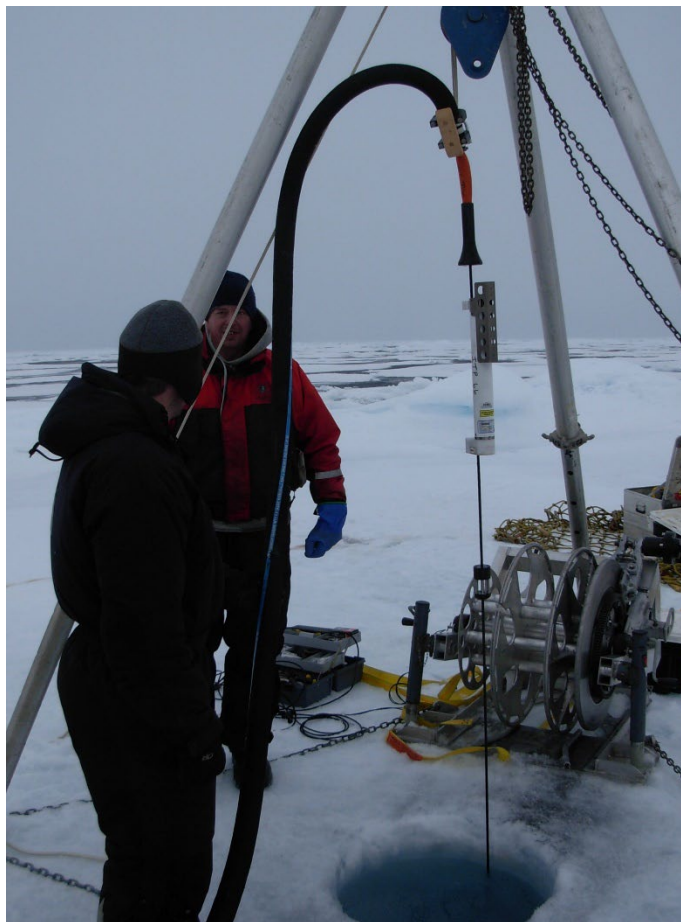


day 2012

Plot of Microcat time series

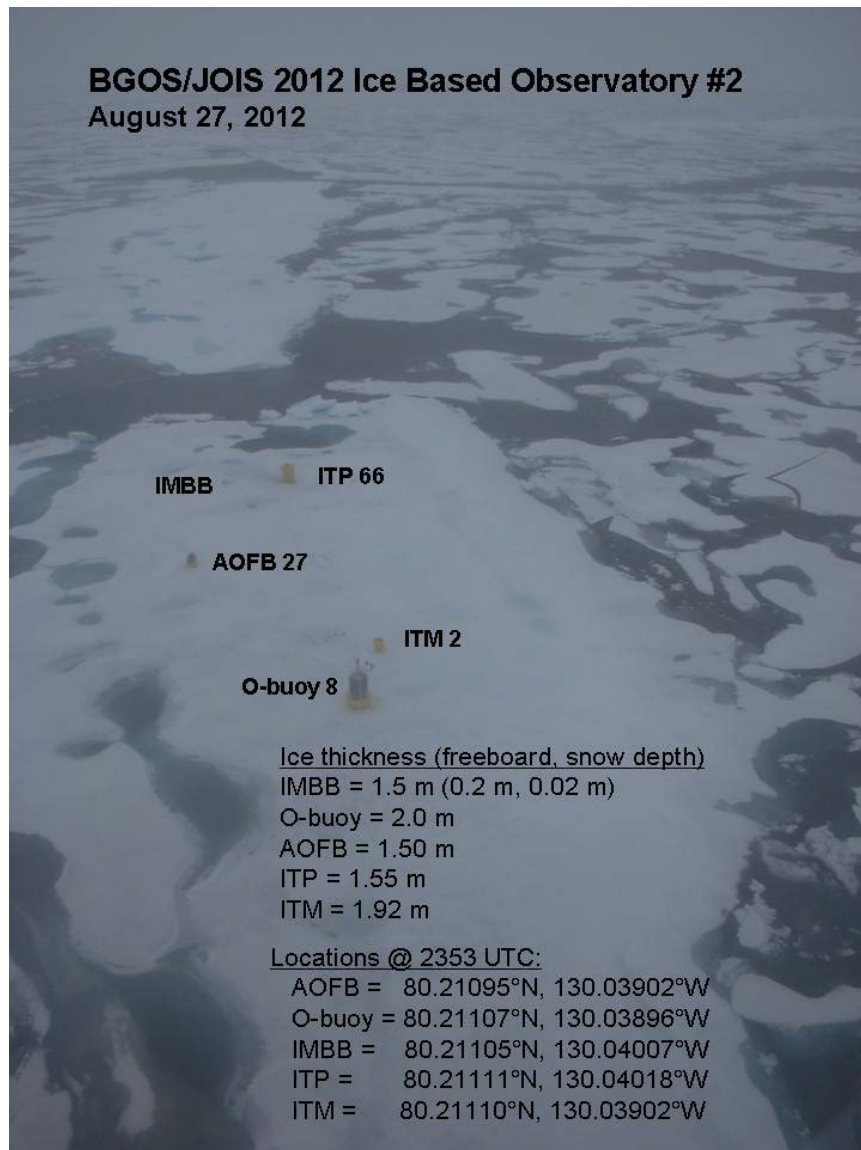


Just prior to returning to the ship, the last crewmembers on the ice pack up the bear protection shortly after the second and last Ice-Based Observatory was deployed during JOIS 2012 consisting of (from left to right), an O-buoy, AOFB, ITM, IMBB, and ITP 66. (Rick Krishfield)



The microcat on ITP 66 is mounted just below the urethane encased section of the tether – nominally ending up at 6 m below the ice surface after deployment. (Rick Krishfield)

BGOS/JOIS 2012 Ice Based Observatory #2
August 27, 2012



Aerial view immediately after deployment of the second IBO with ITP 66 deployed during JOIS 2012. (Rick Krishfield)