

## ITP37 Overview

**Deployment Location:** 8/30/2009, 08:00 UTC at 81° 55.7'N, 120° 10.1'E

**Last Location:** 5/6/2011, 23:02 UTC at 80° 23.2' N, 21° 16.3' E

**Duration:** 615 days

**Distance Traveled:** 5829 km

**Number of profiles:** 962 in 481 days

**Other instruments:** none

ITP 37 was deployed in open water in the Transpolar Drift in collaboration with the Nansen and Amundsen Basins Observational System (NABOS) project from *I/B Kapitan Dranitsyn*. The ITP operated on a typical sampling schedule of 2 one-way profiles between 7 and 760 m depth each day. After sampling across the Arctic Eurasian basins for 16 months, the buoy grounded in northeast Svalbaard, and the surface package was recovered on May 7, 2011 on a helicopter survey from the *RV Lance* by scientists from the Norwegian Polar Institute Centre for Ice, Climate and Ecosystems (ICE).

## ITP37 Deployment Operations

After heading as far north and west as allowed by the NABOS cruise track and Russian territorial waters, ice conditions dictated that ITP 37 be deployed anchor first over-the-side of the vessel in open water (like the deployment of ITP 36 on the previous day). The deployment procedures were the same as the other ITP, and the system was successfully deployed in the morning after a short, streamlined operation.

## ITP37 Data Processing

ITP37 transmitted 962 profiles until December 24, 2010 that were processed according to the procedures described in the ITP Updated Data Processing Procedures. However, the profiler stopped crawling on the wire after profile 914 (November 30, 2010), and entries past this number were deleted from the final data set. The processing parameters for this ITP are shown in the figures to the right. Thermohaline staircases were generally present, enabling CTD lag corrections.

There were two major "fouling" events. Both started somewhat benign with profile noise slowly increasing over a series of profiles. Later hysteresis in TS space picked up, eventually becoming obvious in density profiles as well, until the data clearly became unusable. The first event started around profile 43, but very clean data suddenly re-appeared with profile 128. The second event started around 623, but in this case the record never recovered. In both instances, the profiles were first marked as questionable (qflag=1) before the worst data were removed; it was difficult

and rather arbitrary to decide where to set these transitions. Beyond these two dramatic events, a smaller set of glitches was removed from an additional small number of profiles in other parts of the record.

## ITP37 Data Description

The ITP profiler was configured to operate with a standard sampling schedule of 2 one-way profiles between 7 and 750 m depth each day. In the surface package, the GPS receiver was powered hourly to obtain locations, and buoy temperature and battery voltage status were recorded.

After deployment, the systems survived freeze up and drifted across the Amundsen and Nansen Basins with the Transpolar Drift for 16 months acquiring a long section of temperature and salinity profiles until the mooring tether dragged on the slope north of the Barents Sea. Less than 3 weeks later (on January 11, 2011), transmissions stopped being received from the surface package, presumably because the buoy was pushed under ice. On March 3, 2011, transmissions resumed with the buoy located just north of the Svalbard archipelago, but the backlog of status files showed that GPS locations were unable to be obtained during the silent period. Three weeks later the system grounded on Northeast Land, where it remained unmoving until it was retrieved in May.

The plots below are of the final, calibrated, edited data (as opposed to the raw data presented on the active instrument pages).

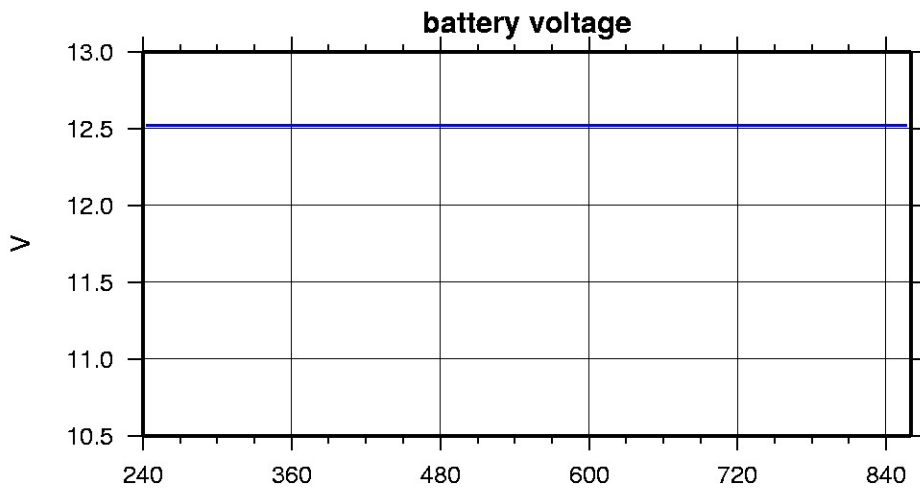
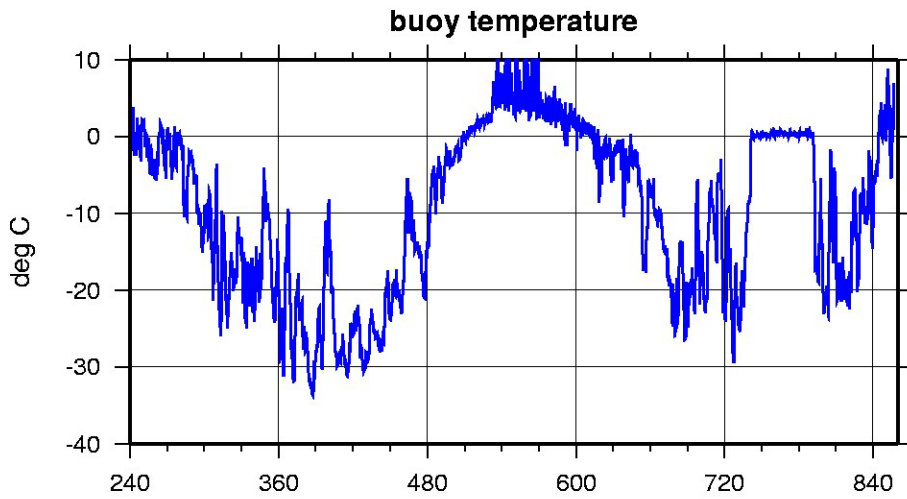
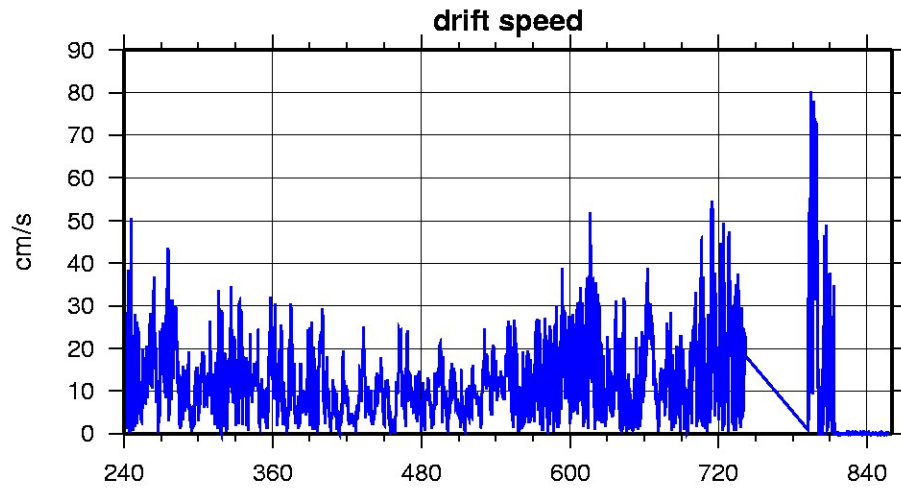
Level II hourly buoy location data in ASCII format: `itp37rawlocs.dat`

Level III 1-Hz processed profile data in MATLAB format: `itp37cormat.tar.Z` or `itp37cormat.zip`

Level III 1-db bin-averaged processed profile data in MATLAB format: `itp37final.mat`

Level III 1-db bin-averaged processed profile data in ASCII format: `itp37final.tar.Z` or `itp37final.zip`

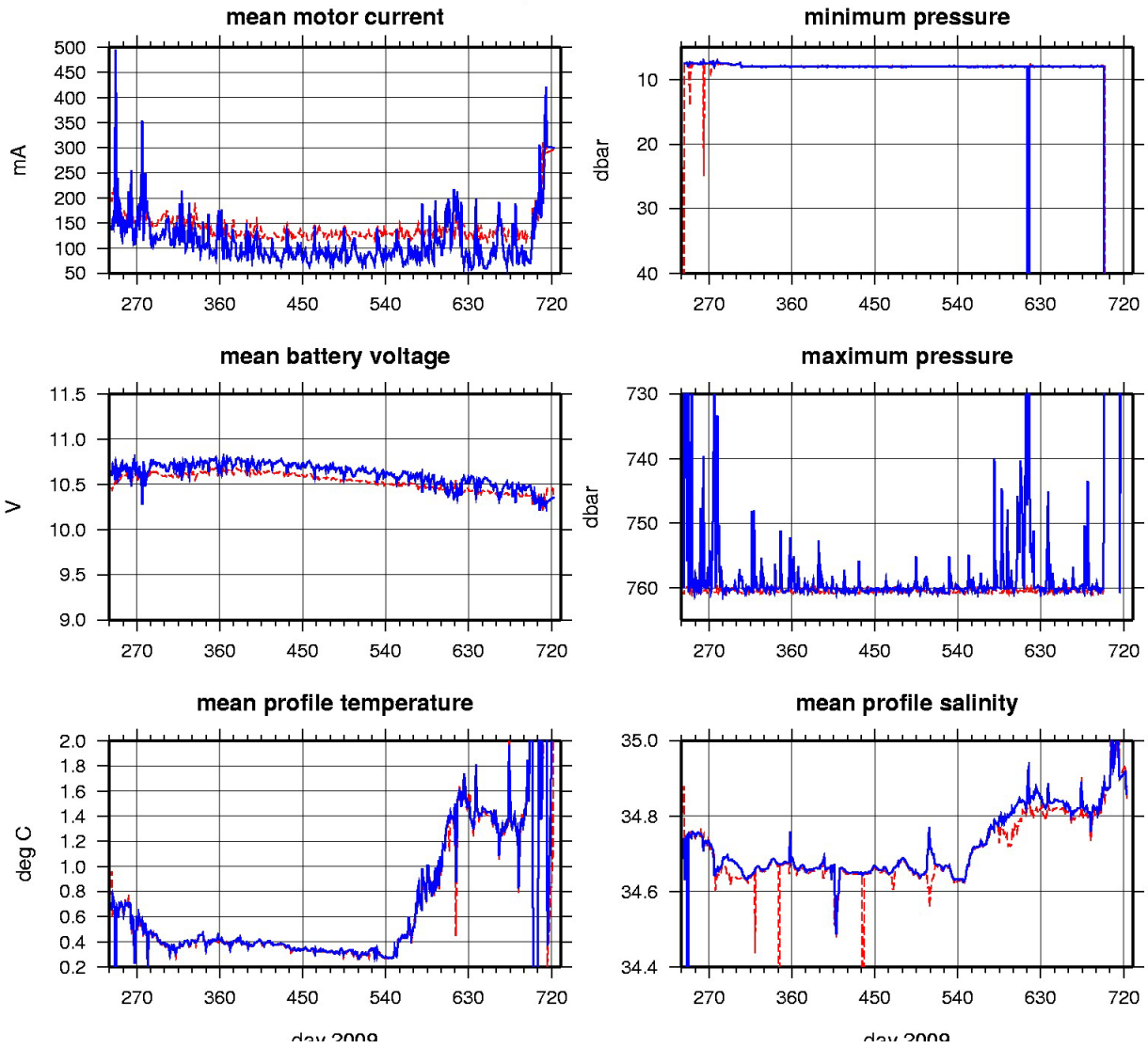
# ITP37 Buoy Status (as of 2011/05/06)



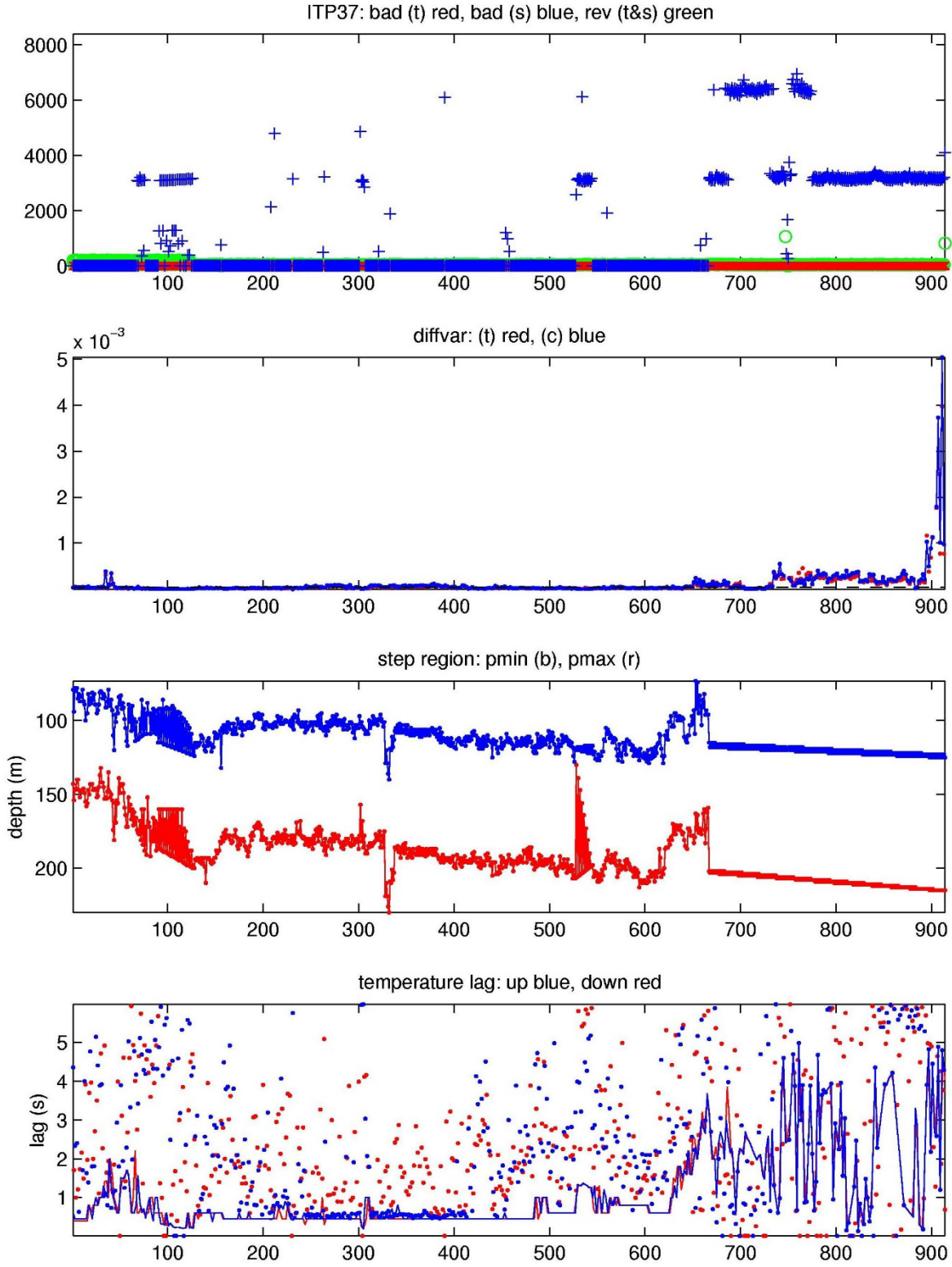
day 2000  
ITP Surface Buoy Status.

### ITP37 Profiler Status (up to profile 962)

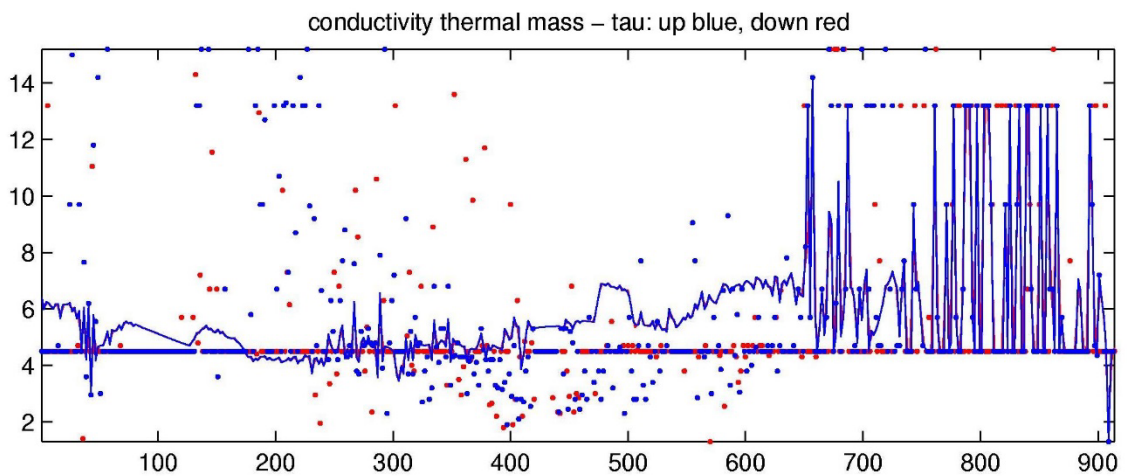
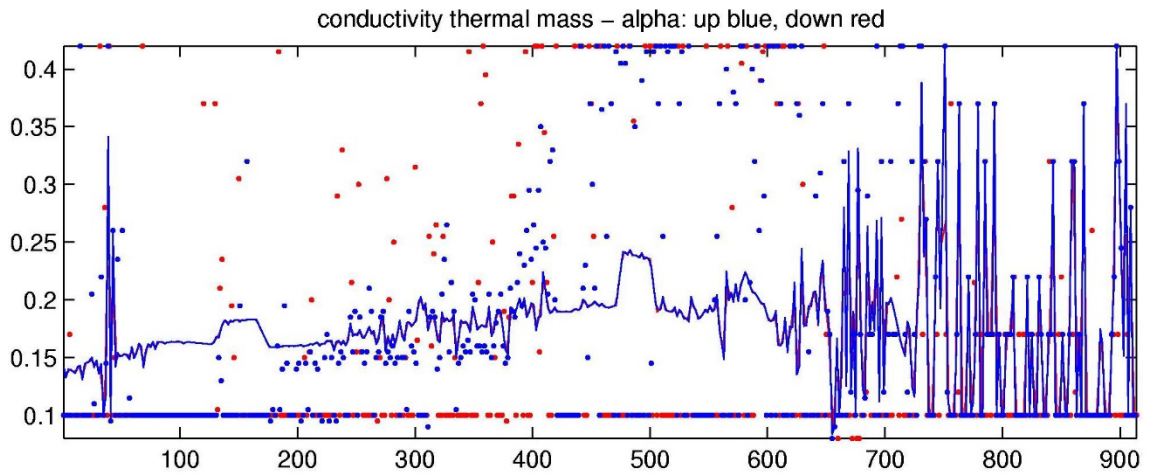
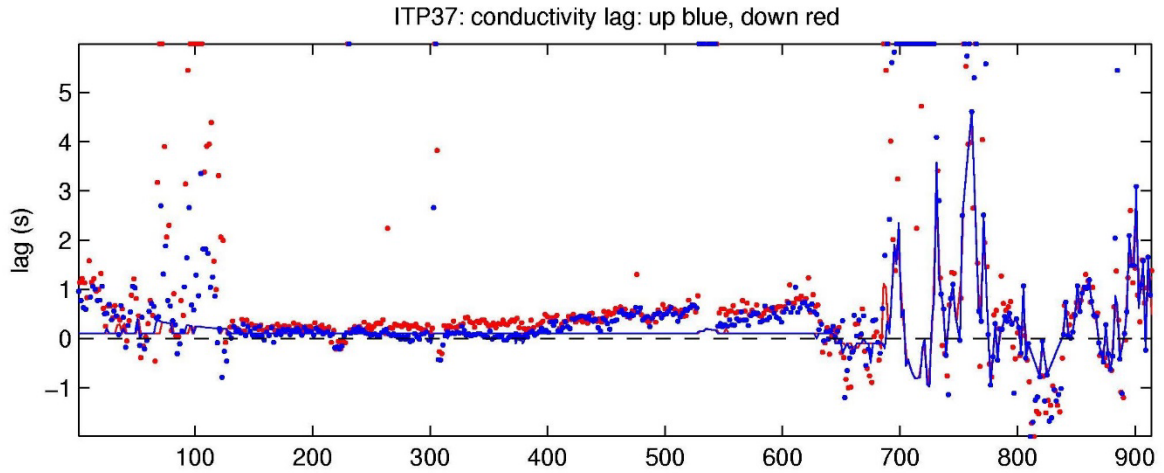
*up solid, down dashed*



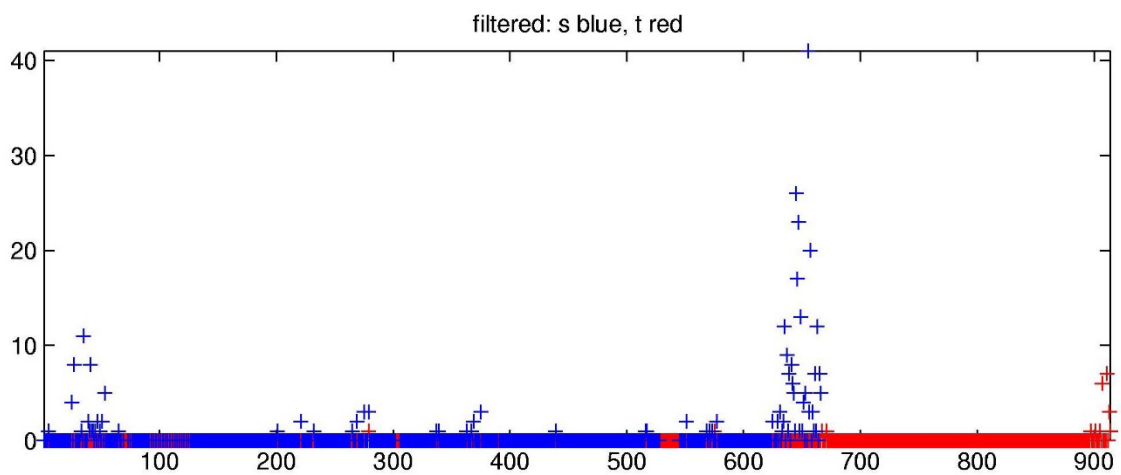
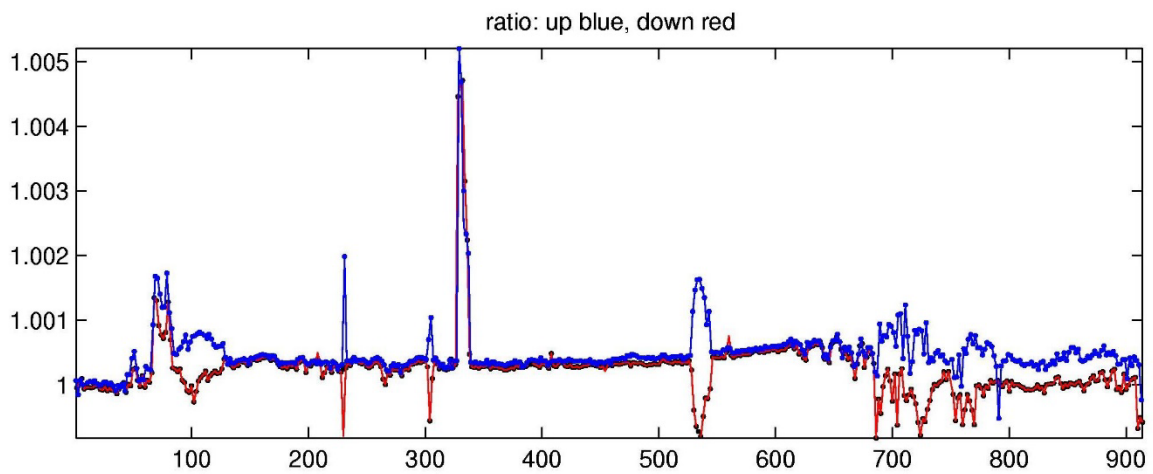
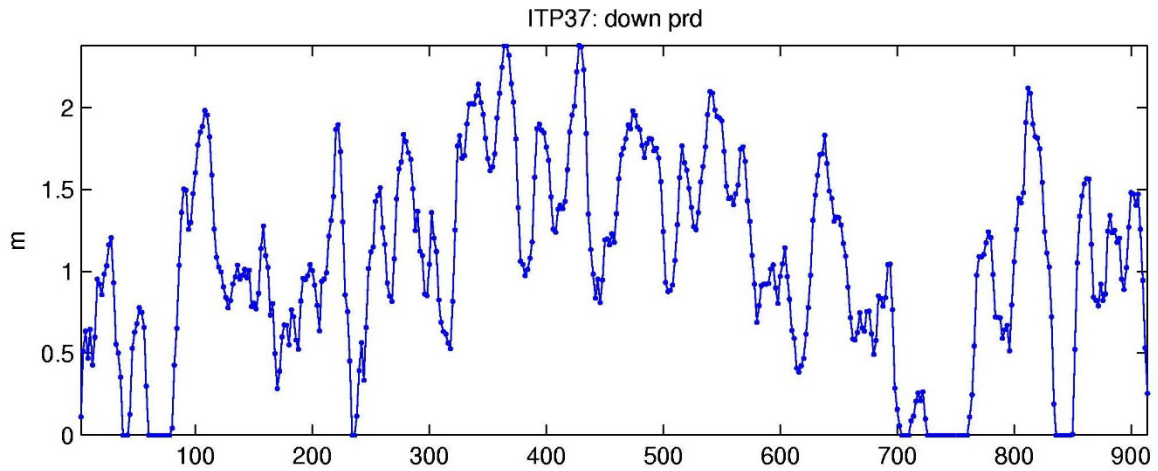
ITP profiler engineering data.



Top: number of bad points removed, Middle: variance of vertical difference of temperature and salinity in step region for up-going profiles, Bottom: temperature lag.

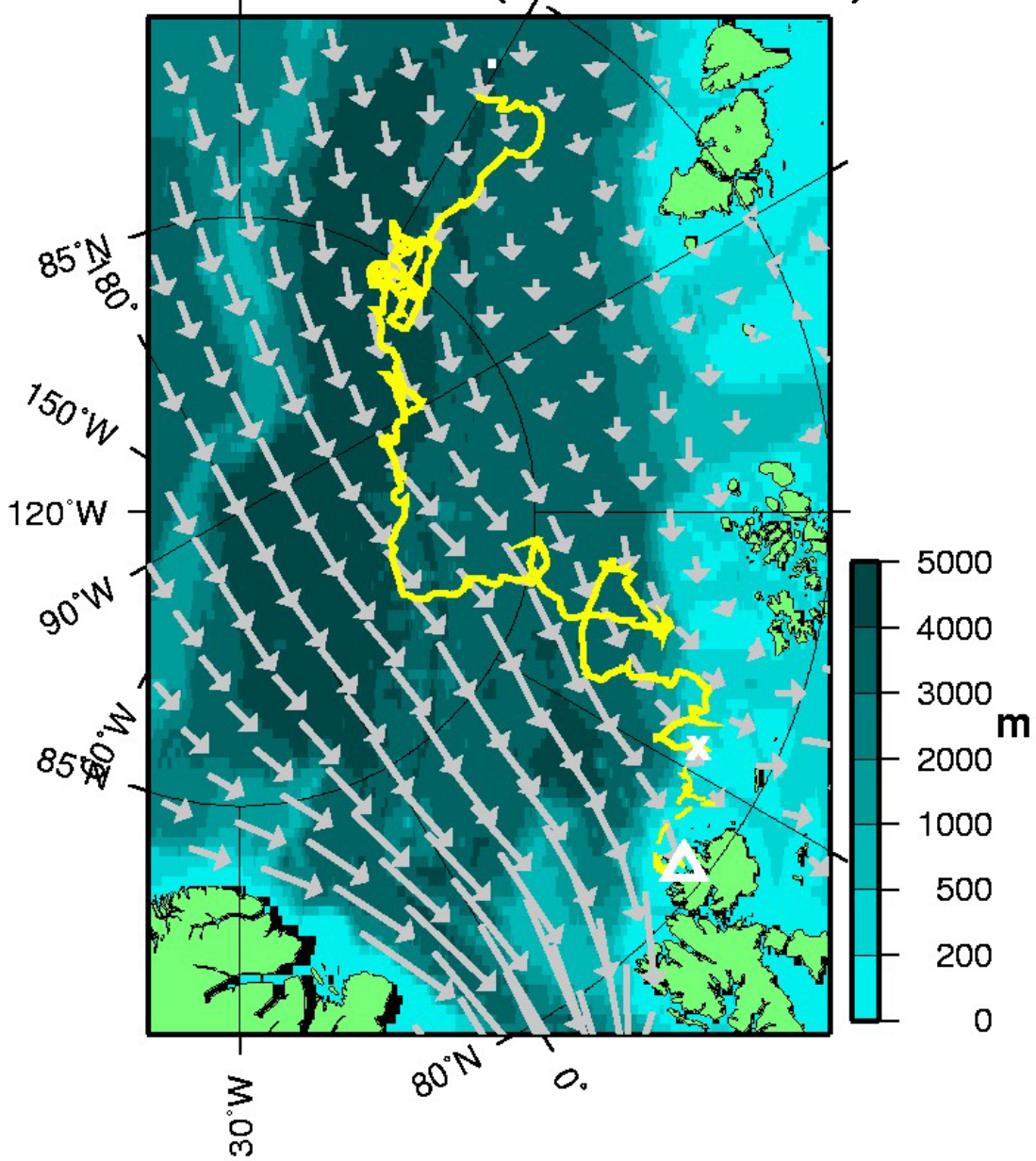


Top: conductivity lag, Middle: conductivity thermal mass amplitude correction, Bottom: conductivity thermal mass lag correction.



Top: down pressure deviation correction, Middle: salinity ratio adjustment, Bottom: Number of filtered spikes.

### ITP37 Drift Track (as of 2011/05/06)



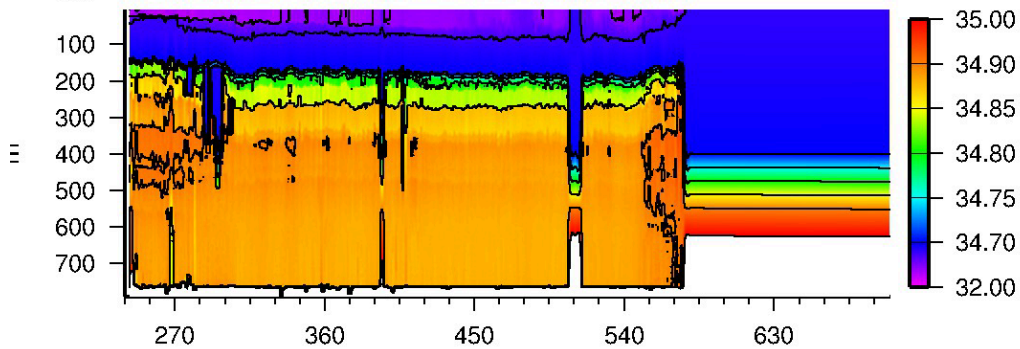
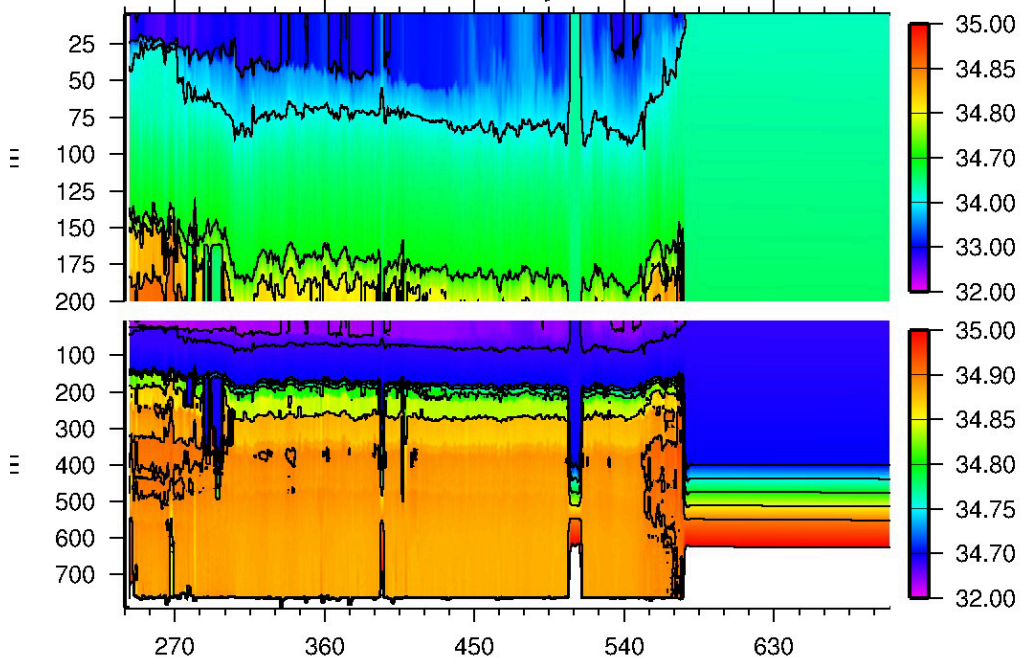
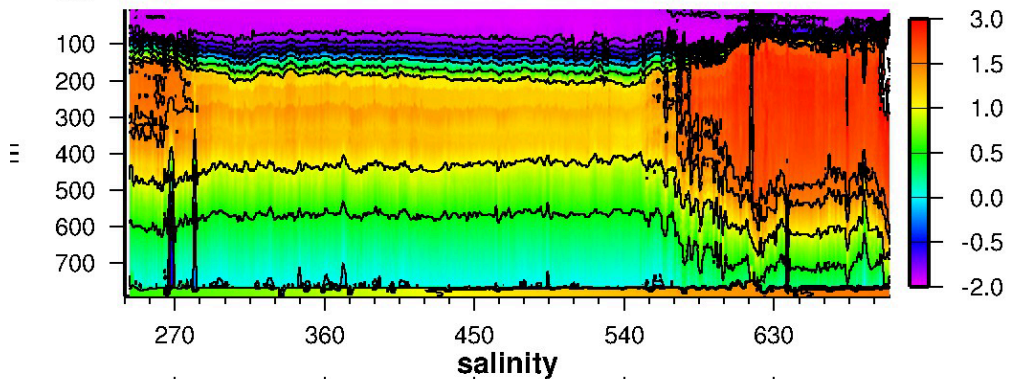
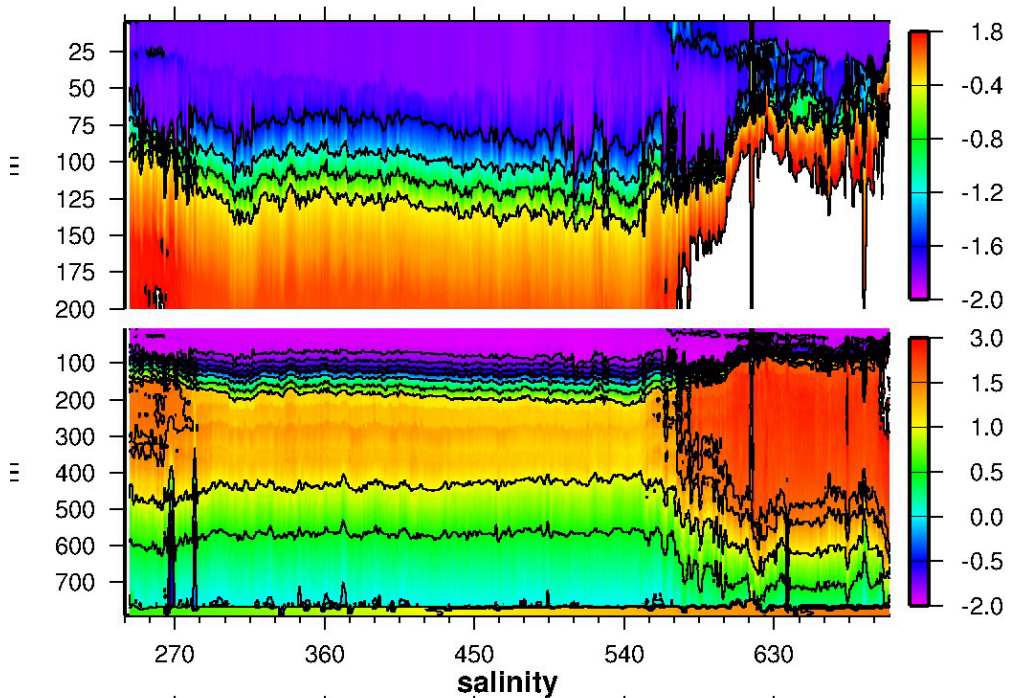
**ITP drift (yellow line), last profile (cross), and last location (triangle), and annual ice drift from IABP (grey vectors) on IBCAO bathymetry (shading).**

Plot of buoy locations.



### ITP37 Up Profile Contours (to profile 914)

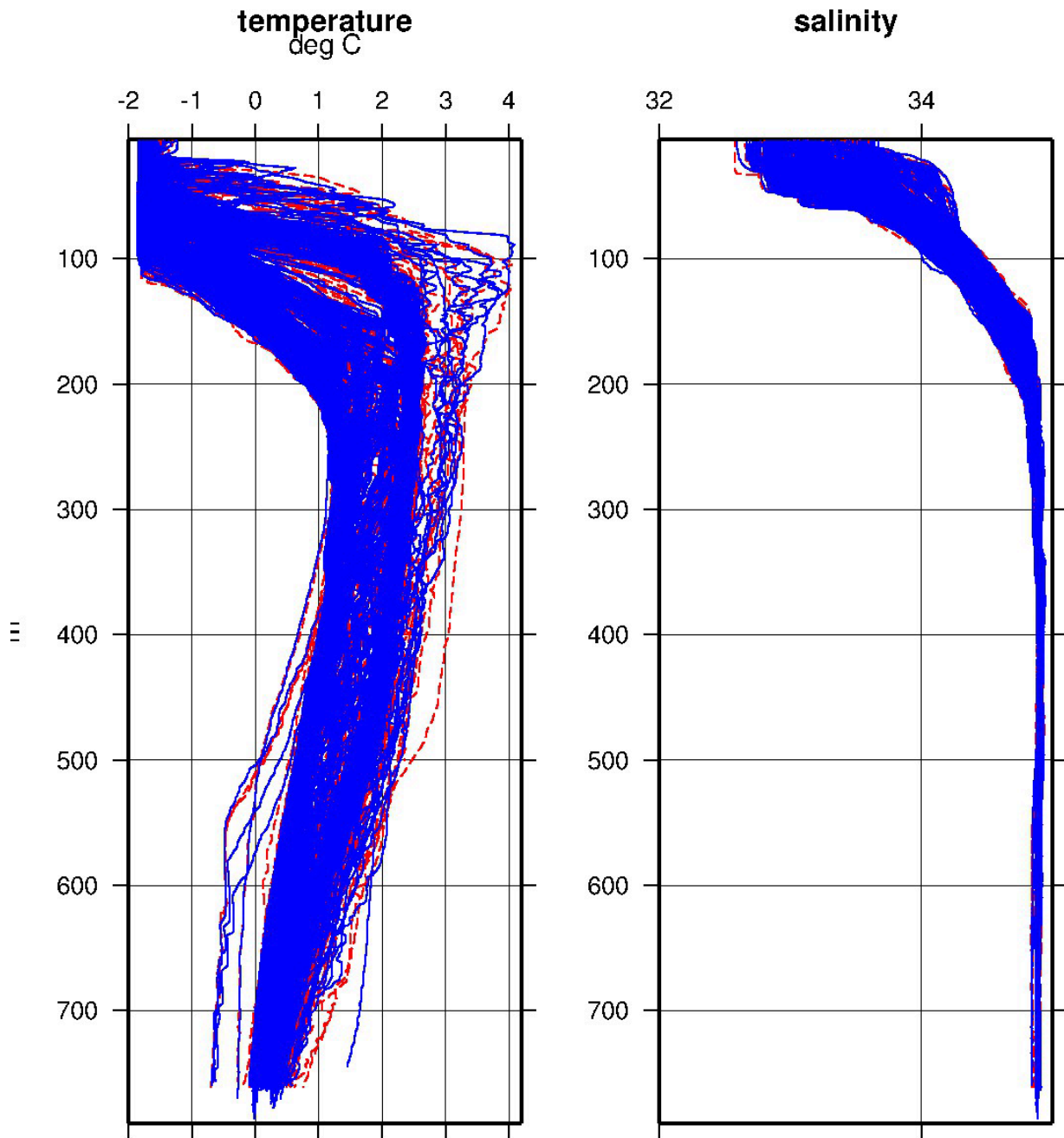
temperature



day 2009

ITP37 temperature and salinity contours.

### All ITP37 Profiles (up to profile 914)



*up solid, down dashed*

Composite plot of ITP temperature and salinity contours.



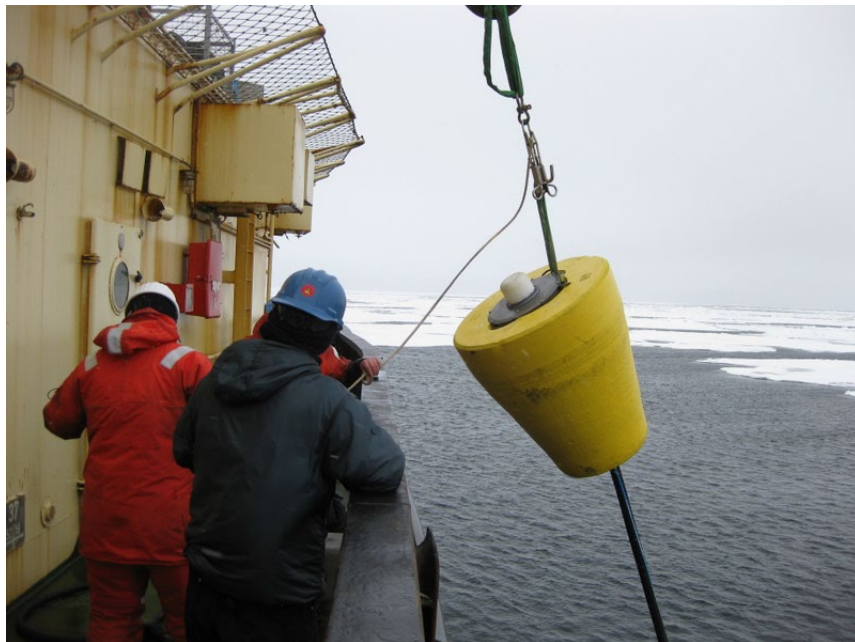
Shortly after the over-the-side deployment of ITP 37, the surface package bobs on the surface before the edge of the ice pack. (Jeff Pietro)



ITP 37 surface package continued to transmit locations while grounded in ice northeast of Svalbaard up until it was recovered. (Photo courtesy of Nalan Koe)



The ITP profiler sits on the bottom bumper during the over-the-side deployment.



Suspended by the quick release apparatus, the completely assembled ITP mooring is lowered outboard of the ship and released into the water.