

ITP 17 Overview

Deployment Location: 9/15/2007, 3:04 UTC at 86° 1.8'N, 105° 4.6'E

Last Location: 6/28/2009, 20:00 UTC at 63° 38.3' N, 20° 22.4' W

Duration: 653 days

Distance Traveled: 12,979 km

Number of profiles: 235 in 36 days (454 attempted in 115 days)

Other instruments: none

ITP17 was deployed on a 1.7 m thick icefloe in the Transpolar Drift from the Russian icebreaker *Akademik Federov* in collaboration with the European Union DAMOCLES Program. The ITP was scheduled for a rapid sampling schedule of 3 one-way profiles between 7 and 760 m depth each day but became progressively hampered by electronic and mechanical problems so that the profiler could not move from the bottom stop after 5 weeks. The surface float seems to have been covered by ice at 87°N on December 31, 2007, when it continued to call in but was unable to acquire GPS locations until it resurfaced in the East Greenland Sea near 75°N in July 2008, then drifted into the Irminger Sea until March 2009 when it was removed to Iceland.

ITP 17 Deployment Operations

The last ITP deployment of the cruise (and last of all buoys in 2007) was performed without helicopter support, except for evacuation at the end. Just after midnight (UTC) the profiler was loaded with the schedule, the gear and the deployment party were loaded over the side onto the ice, the ITP deployed and tested by 3 AM, and the party retrieved.

ITP17 Data Processing

The 454 profile attempts that were recovered from the ITP were processed according to the procedures described in the ITP Updated Data Processing Procedures but only 218 good profiles resulted. The processing parameters for ITP 17 are shown in the figures to the right. The profiler sampled as scheduled for the first 16 days, then spontaneously began profiling approximately every 3 hours for the next 20 days and ended with 236 profiles with the same time and the profiler on the bottom bumper.

Of the 218 good profiles, only a few include pseudo-thermohaline staircase structures, from which typical sensor lags are determined. These are applied to the remainder of the series where staircases are absent. The profiler also was interrupted by 15 software resets. Otherwise, the short dataset had very little biofouling and a stable conductivity calibration ratio throughout.

ITP17 Data Description

In the surface package, the GPS receiver was powered hourly to obtain locations, and buoy temperature and battery voltage status were recorded. The profiler appears to have suffered from weight gain after deployment, presumably due to a small leak. The up-profile motor currents steadily increased, while the down profile motor currents steadily decreased, suggesting that the package was getting heavier. Over the second 20 day period, the profiler also began the profiles in both directions 20-40 m deeper than expected (likely due to the instrument sinking on the wire before starting the next profile). After 36 days the ITP profiler stopped profiling (battery voltage went low), but the surface package continued to transmit GPS locations and status for a total of 652 days (with a 194-day gap in locations from January to June 2008).

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

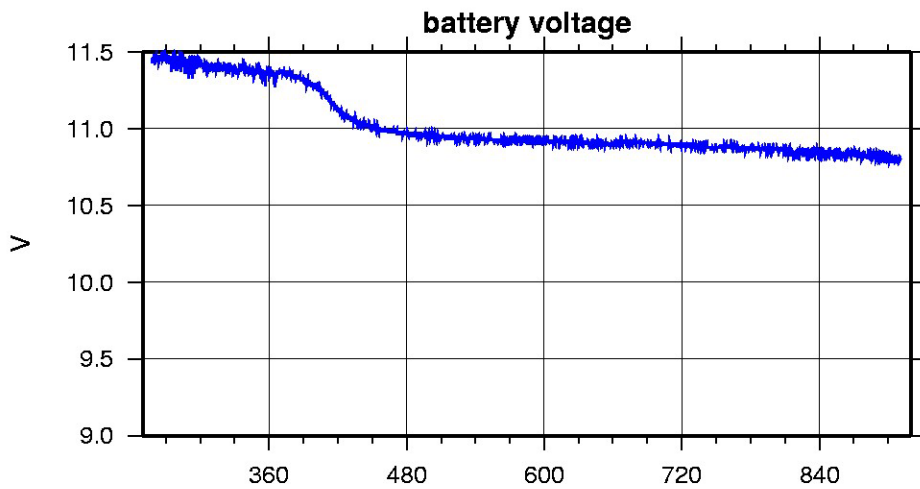
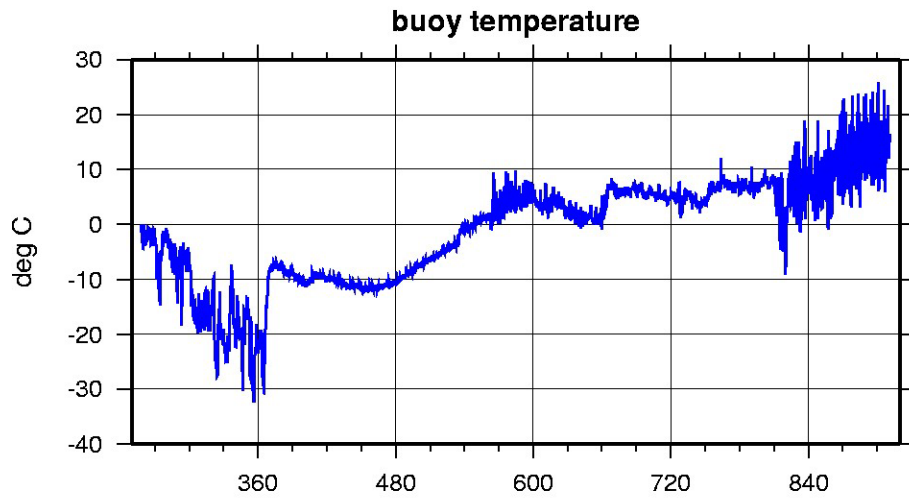
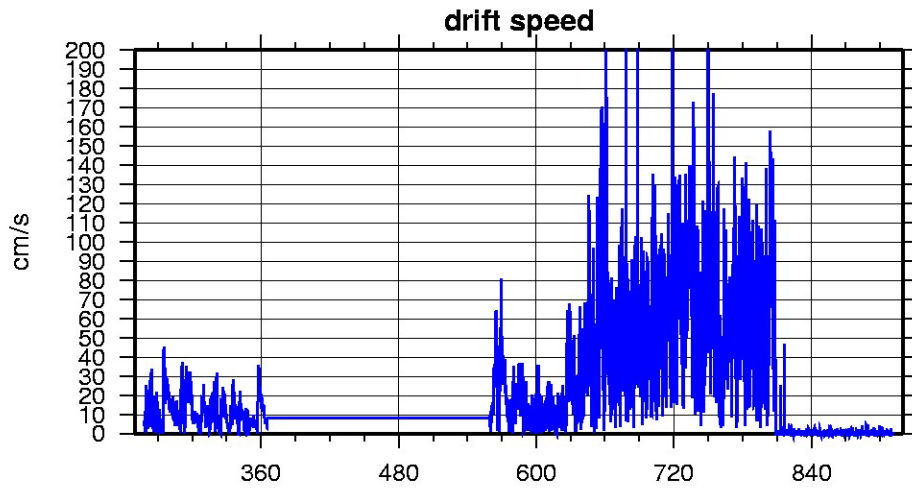
Level II hourly buoy location data in ASCII format: `itp17rawlocs.dat`

Level III 1-Hz processed profile data in MATLAB format: `itp17cormat.tar.Z` or `itp17cormat.zip`

Level III 1-db bin-averaged processed profile data in MATLAB format: `itp17final.mat`

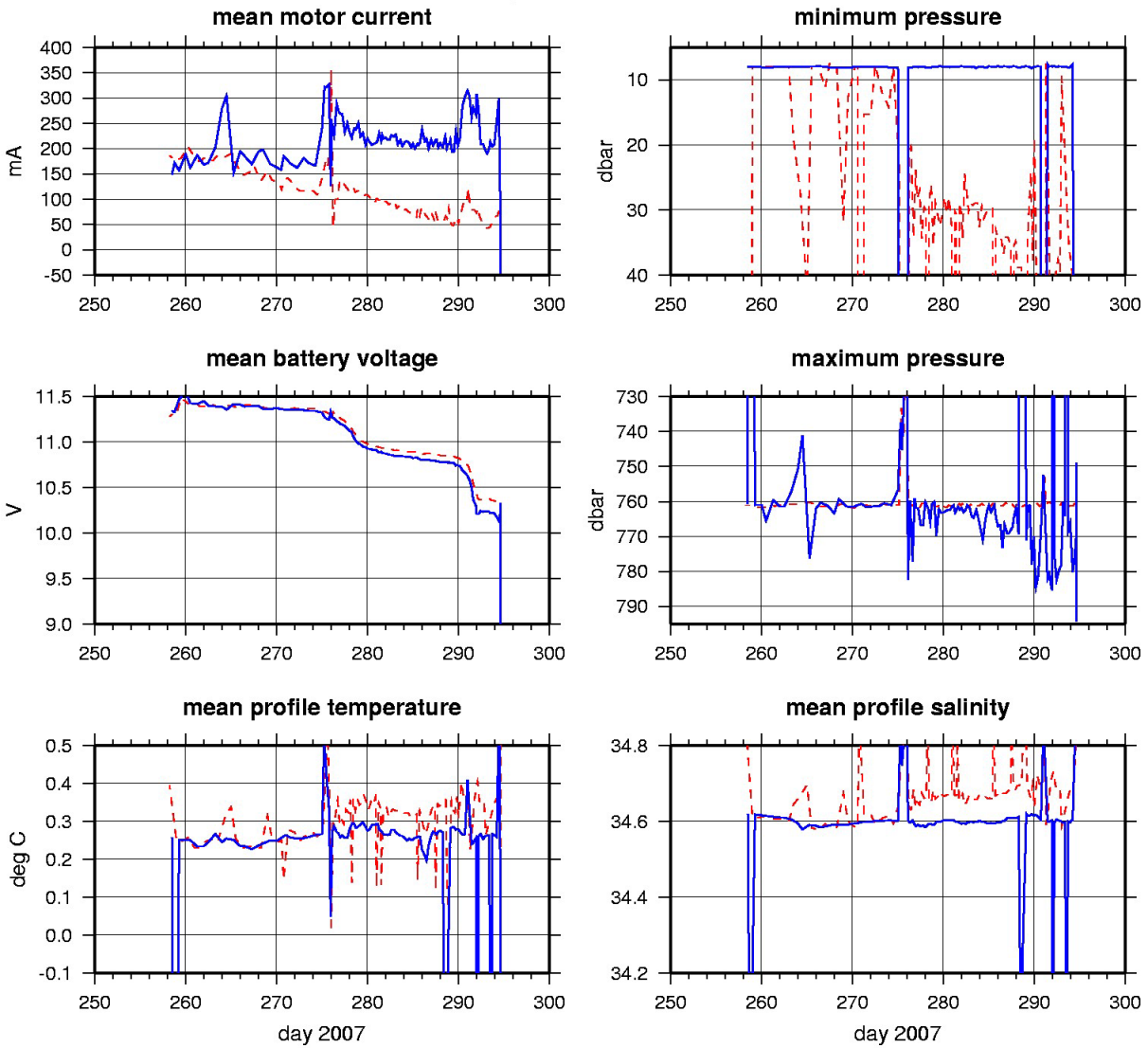
Level III 1-db bin-averaged processed profile data in ASCII format: `itp17final.tar.Z`
or `itp17final.zip`

ITP17 Buoy Status (as of 2009/06/28)

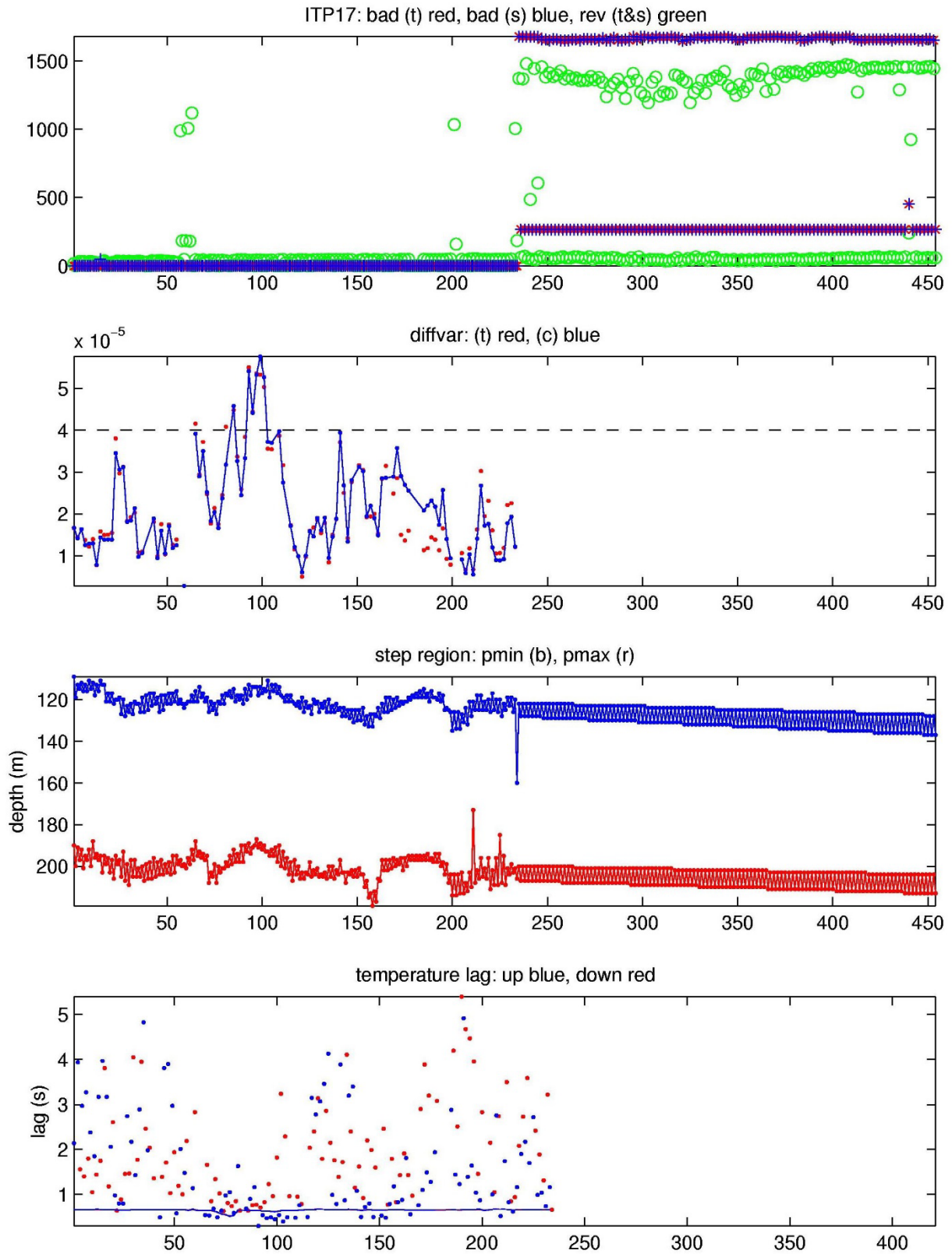


ITP17 Profiler Status (up to profile 454)

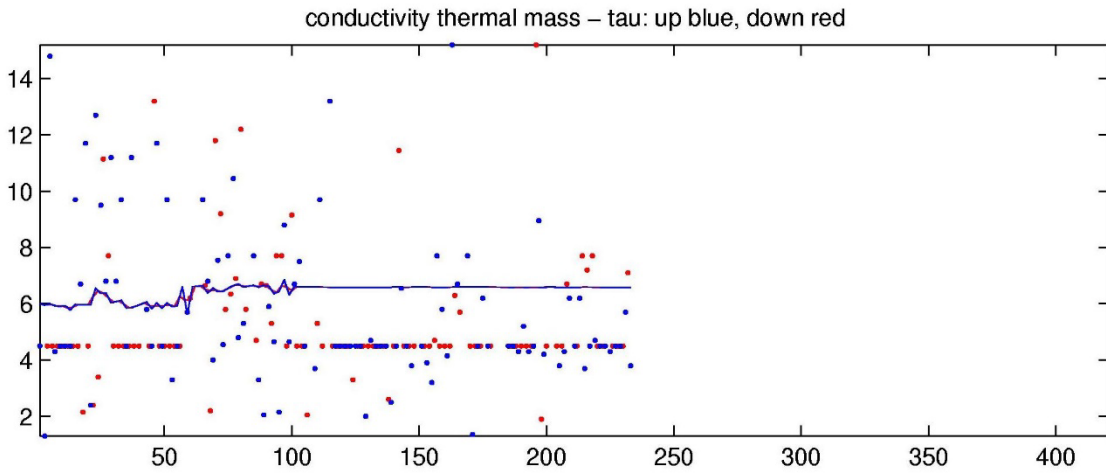
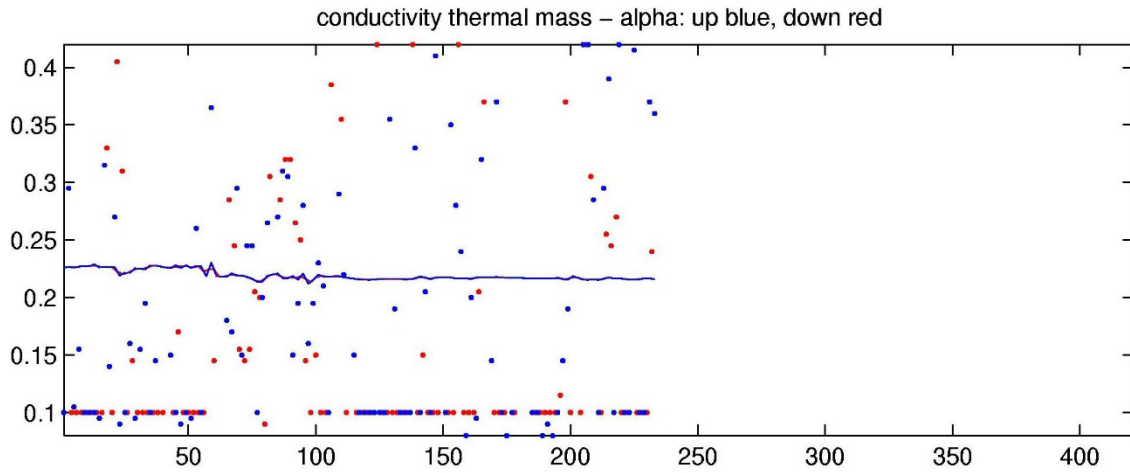
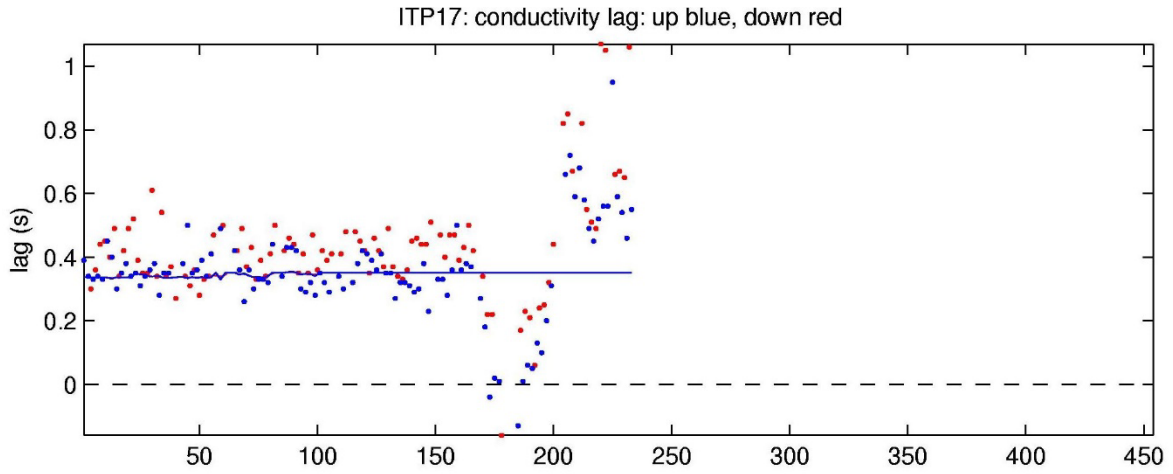
up solid, down dashed



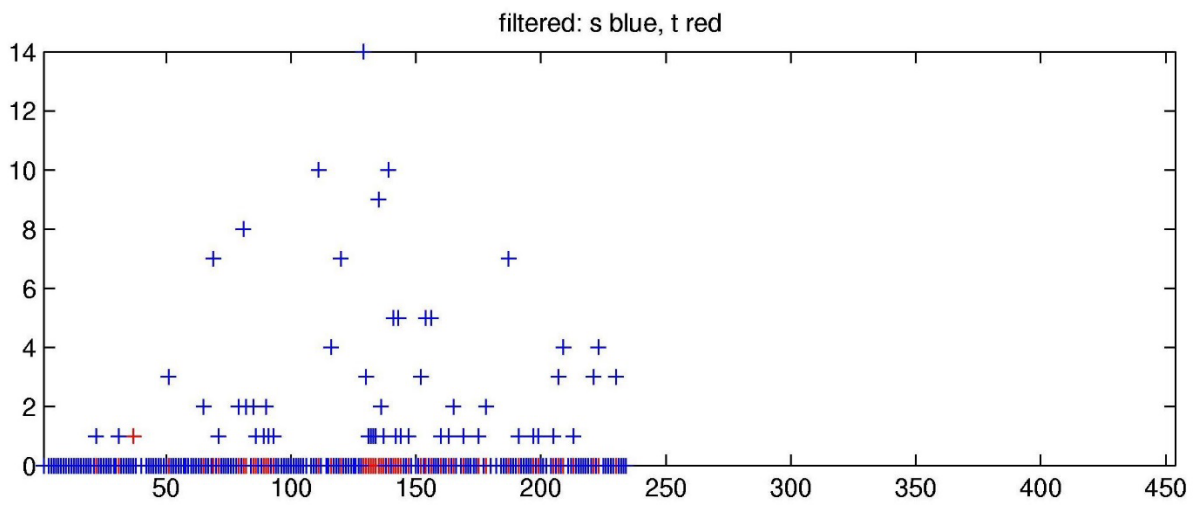
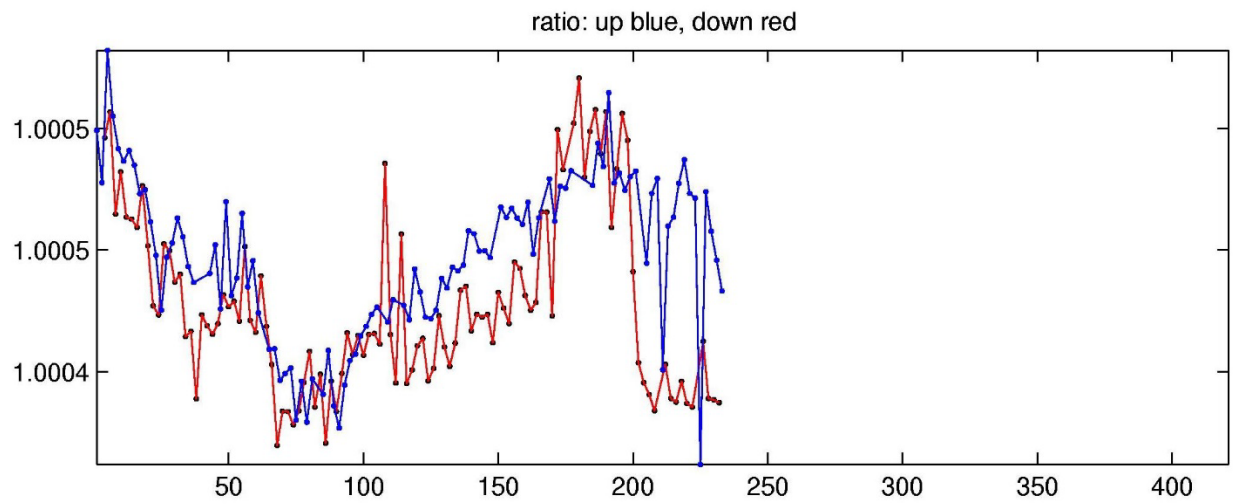
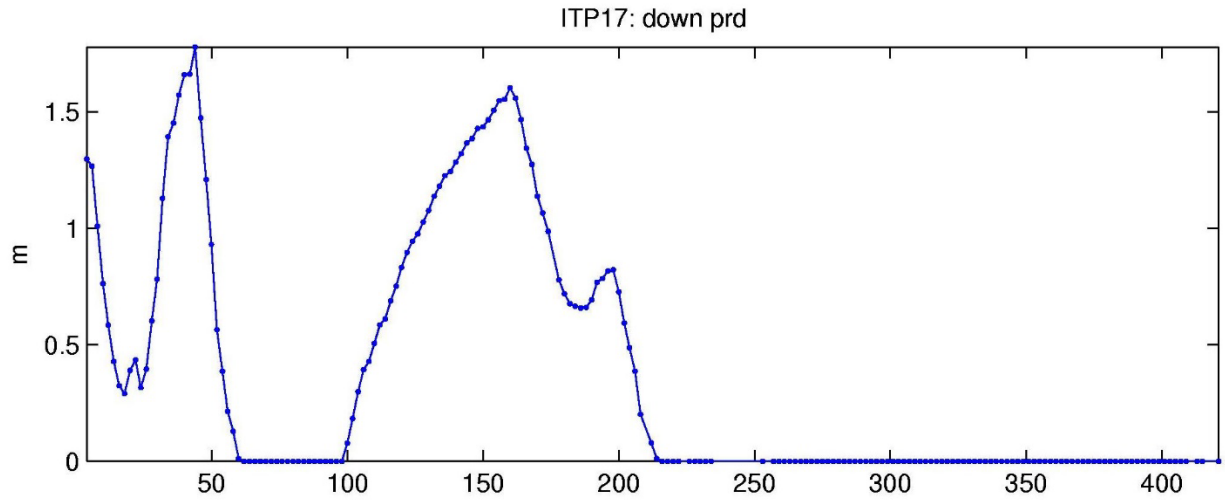
ITP profiler engineering data.



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.

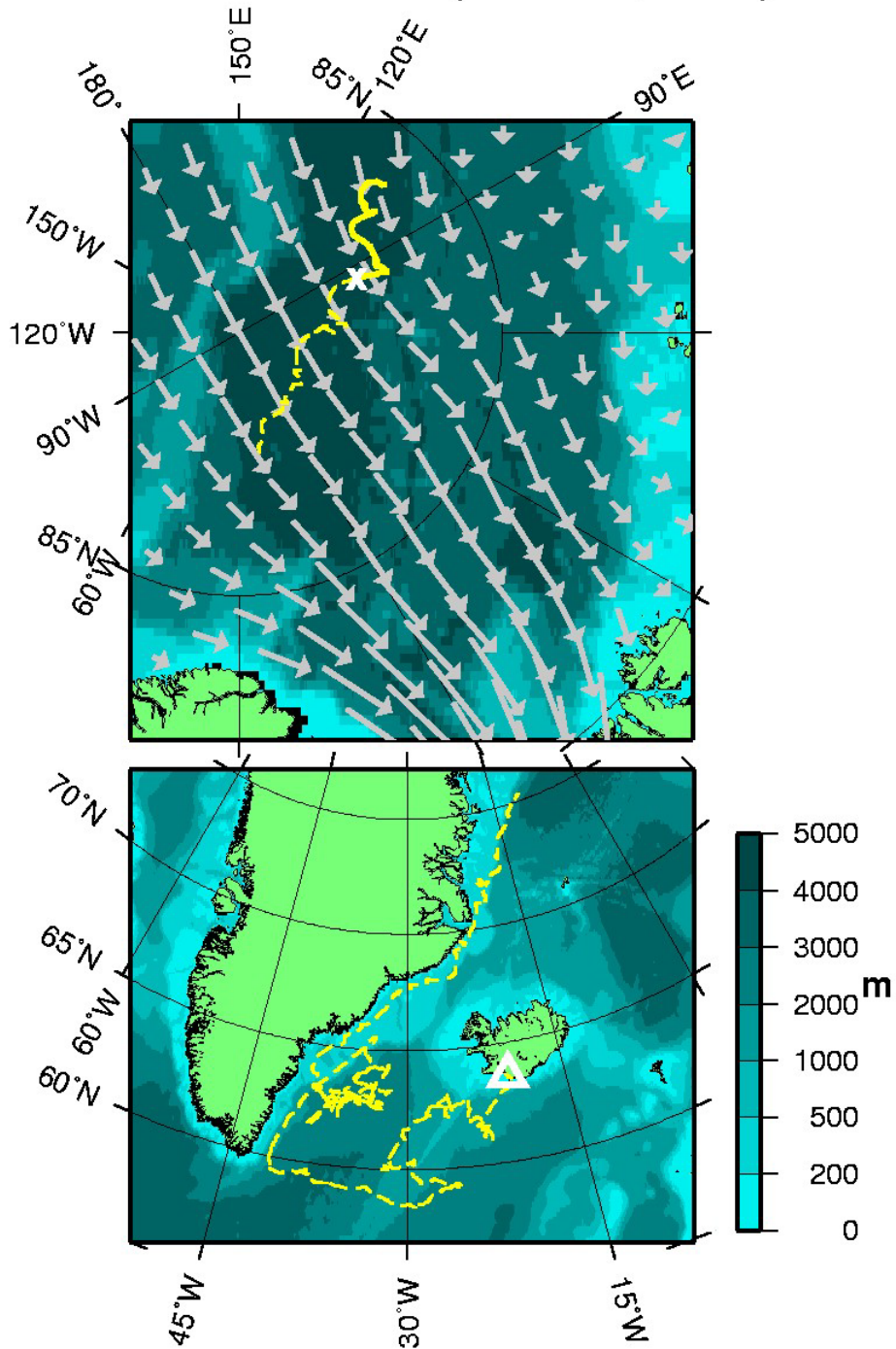


Top: conductivity lag, Middle: conductivity thermal mass amplitude correction, Bottom: conductivity thermal mass lag correction



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

ITP17 Drift Track (as of 2009/06/28)

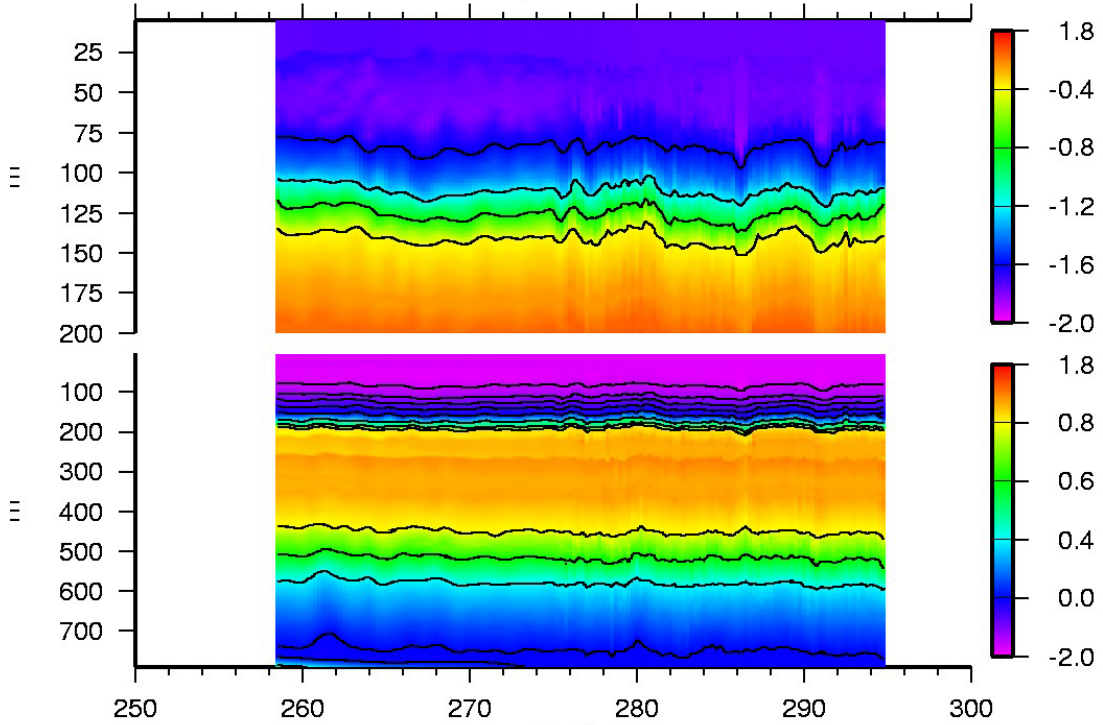


ITP drift (yellow line), last profile (x), last location (triangle), and annual ice drift from IABP (grey vectors) on IBCAO bathymetry (shading).

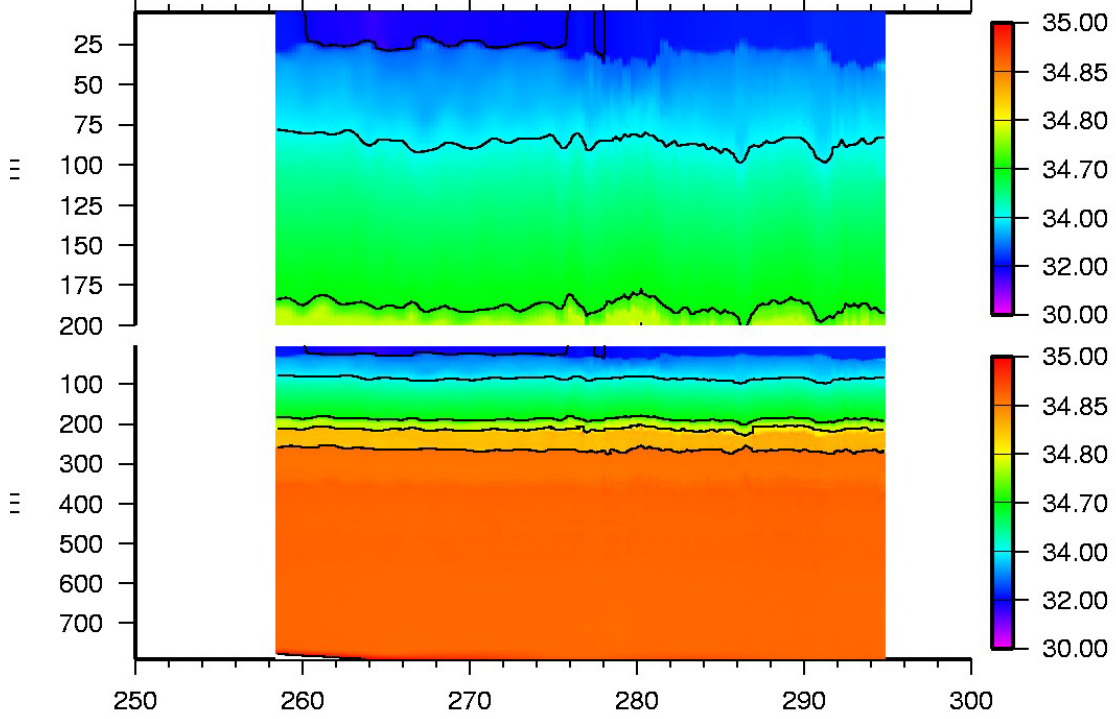
Plot of buoy locations.

ITP17 Up Profile Contours (to profile 454)

temperature



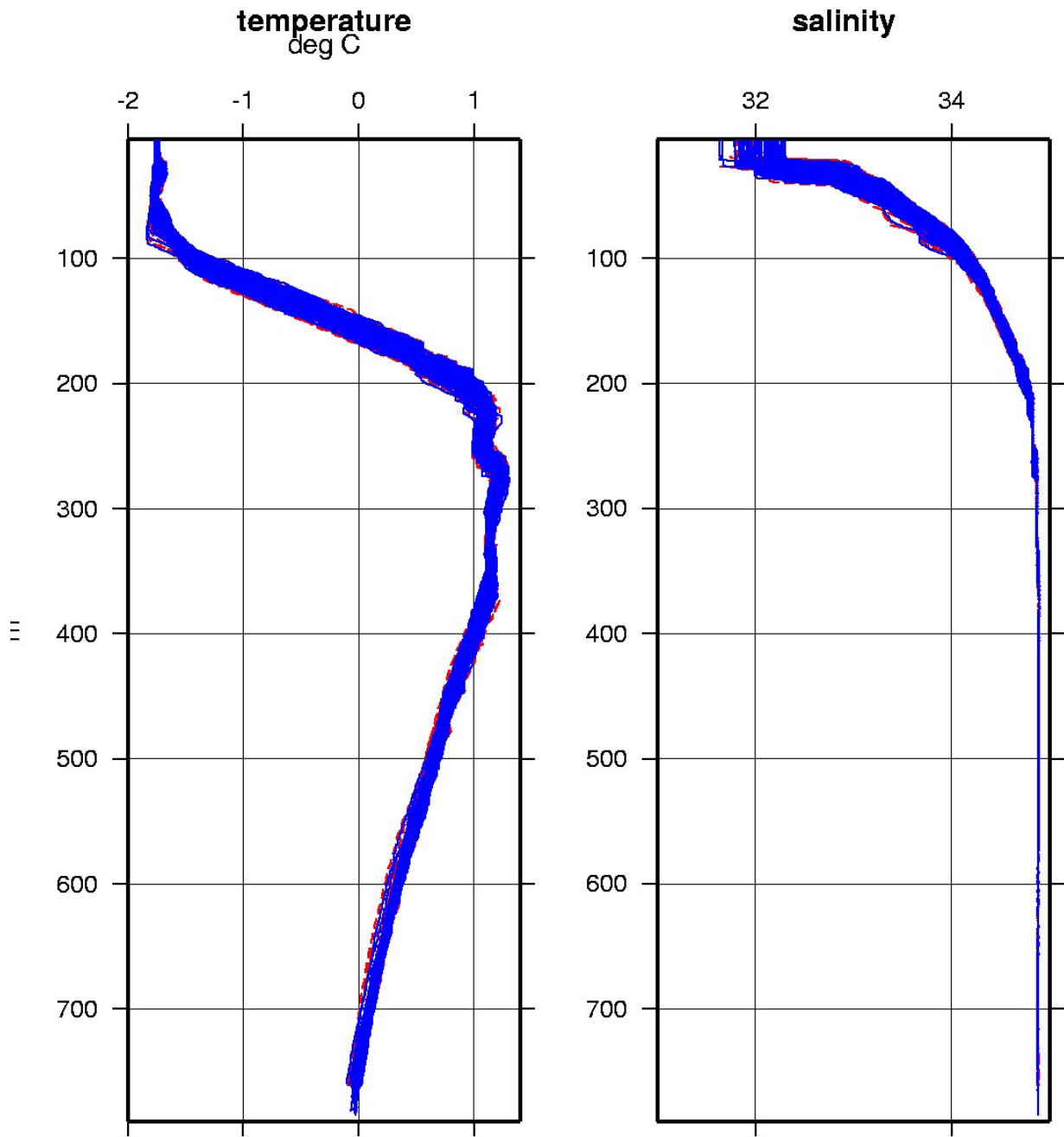
salinity



day 2007

ITP17 temperature and salinity contours

All ITP17 Profiles (up to profile 454)



up solid, down dashed

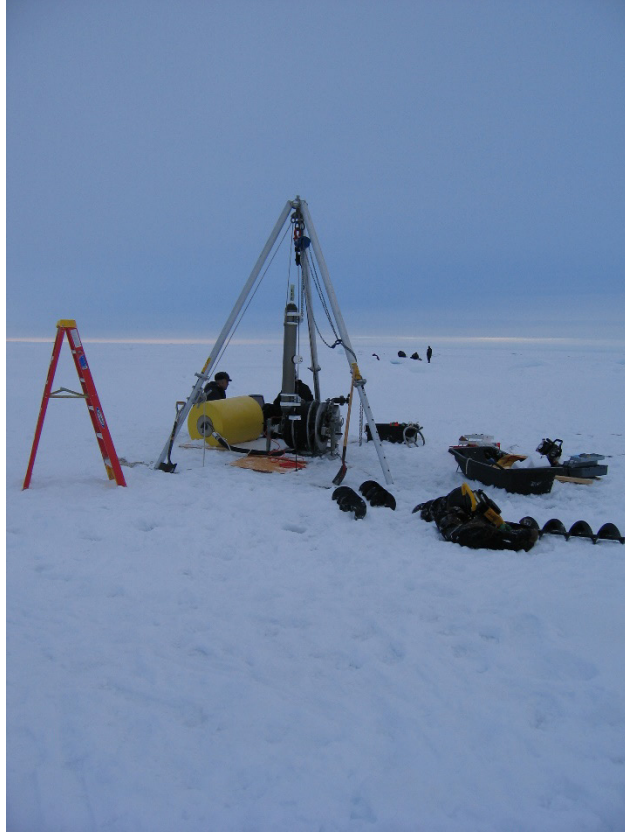
Composite plot of ITP temperature and salinity contours.



Looking back at the Akademik Fedorov after being lowered onto the ice to choose the deployment site. (Photo by John Kemp)



On the ice with ITP, deployment apparatus and several ice drift beacons. (Photo by John Kemp)



Suspended from the tripod, the profiler for ITP 17 is interrogated through the surface package to verify the integrity of the inductive modem circuit. (Photo by John Kemp)



Shortly after the last ITP deployment of the 2007 IPY summer season, the surface package of ITP 17 already has a light dusting of snow. (John Kemp)