

ITP 62 Overview

Deployment Location: 9/4/2012, 17:00 UTC at 76° 57.0'N, 139° 32.4'W

Last Location: 8/11/2013, 23:00 UTC at 74° 49.6' N, 158° 48.4' W

Duration: 341 days

Distance Traveled: 3154 km

Number of profiles: 686 in 342 days

Other instruments: none

ITP 62 was deployed in open water 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. The ITP operated on a typical sampling schedule of 2 one-way profiles between 7 and 760 m depth each day.

ITP62 Deployment Operations

ITP62 was the last of four ITP systems deployed during JOIS 2012 and like the previously deployed ITP (64) was deployed in open water over the side of the CCGS Louis S. St. Laurent. While there was no ice in the vicinity, satellite data indicated that the marginal ice zone was not far north.

Shortly after breakfast, the deployment winch and instrumentation were staged on the foredeck so that the ship's starboard A-frame could be used to lower the mooring into the ocean. The deployment proceeded smoothly until the final communications check with the underwater unit, but after resolving the problem, the system was released and floated away from the ship.

ITP62 Data Processing

The 686 profiles that were transmitted from the ITP were processed according to the procedures described in the ITP Updated Data Processing Procedures. The processing parameters for are shown in the figures to the right. During the first month after deployment presumably wave motion caused the profiler to move up or down the wire (to neutral buoyancy depth) between profiles so that only partial down or up profiles were acquired. Subsequently when the ice froze in around the buoy, full profiles were obtained. Only few did not traverse the full vertical extent, except during a 5-day period in May 2013 when apparently the mooring anchor dragged on the slope near Barrow Canyon. During this time, slack on the cable left the profiler at mid depth without enough tension to climb but recovered when the system fortuitously moved off of the shelf with the cable and anchor seemingly intact.

Thermohaline staircases were apparent in the basin and used to generate initial estimates for CTD lag corrections which were typical. However, both the temperature and conductivity steps diminished after profile 390 and lags had to be extrapolated later.

ITP62 Data Description

The ITP profiler was configured to operate on 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 hourly, and buoy temperature and battery voltage status were recorded.

The buoy initially meandered in circles then headed southward approximately along 135 W longitude, then headed west between 74 N to 72 N before encountering the slope near Barrow Canyon where the anchor apparently dragged the bottom. Fortunately, the system then headed north along 155 W and resumed profiling until it encountered the shallow bathymetry along the Northwind Ridge. The profiler continued to communicate data to the surface package until the Iridium transmissions ceased in August.

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

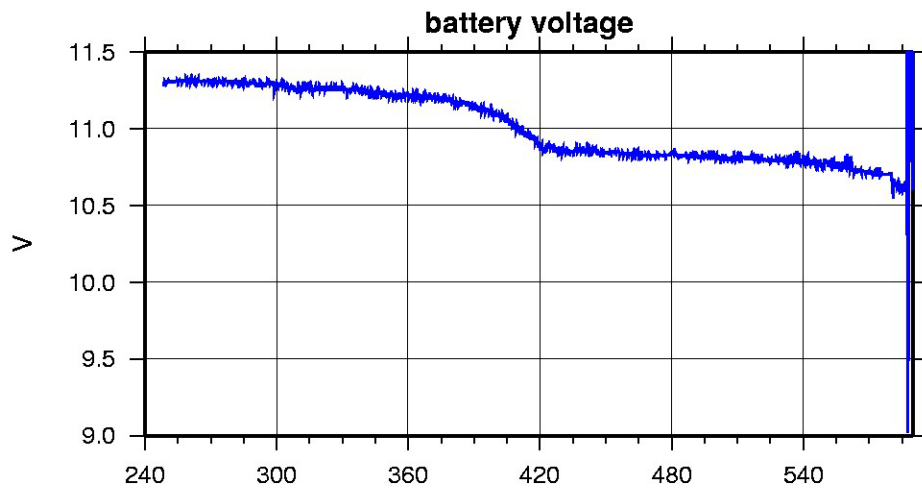
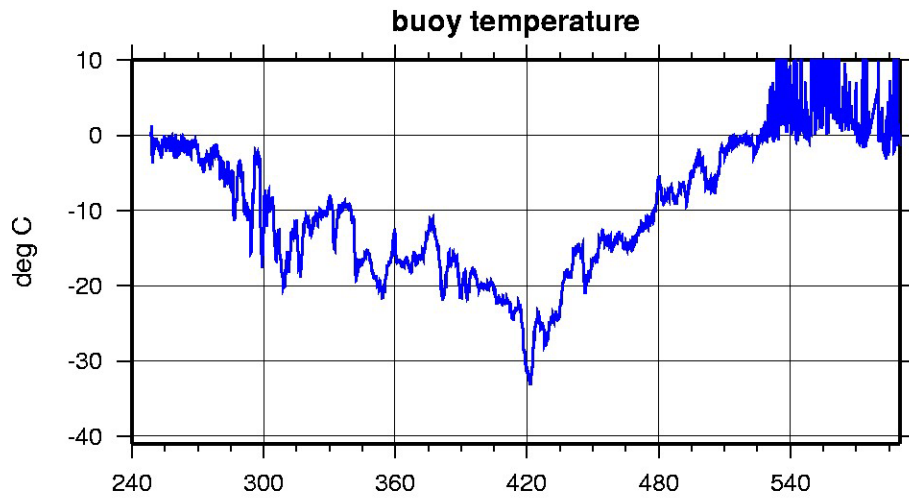
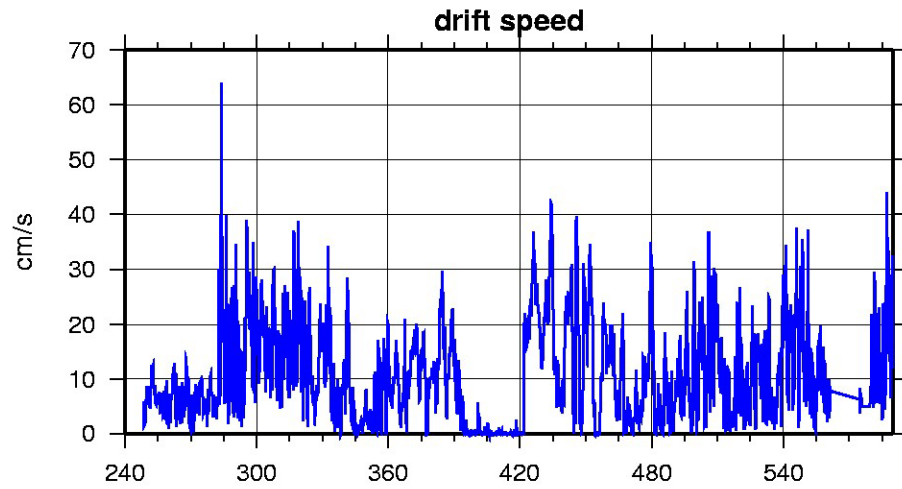
Level II hourly buoy location data in ASCII format: `itp62rawlocs.dat`

Level III 1-Hz processed profile data in MATLAB format: `itp62cormat.tar.Z` or `itp62cormat.zip`

Level III 1-db bin-averaged processed profile data in MATLAB format: `itp62final.mat`

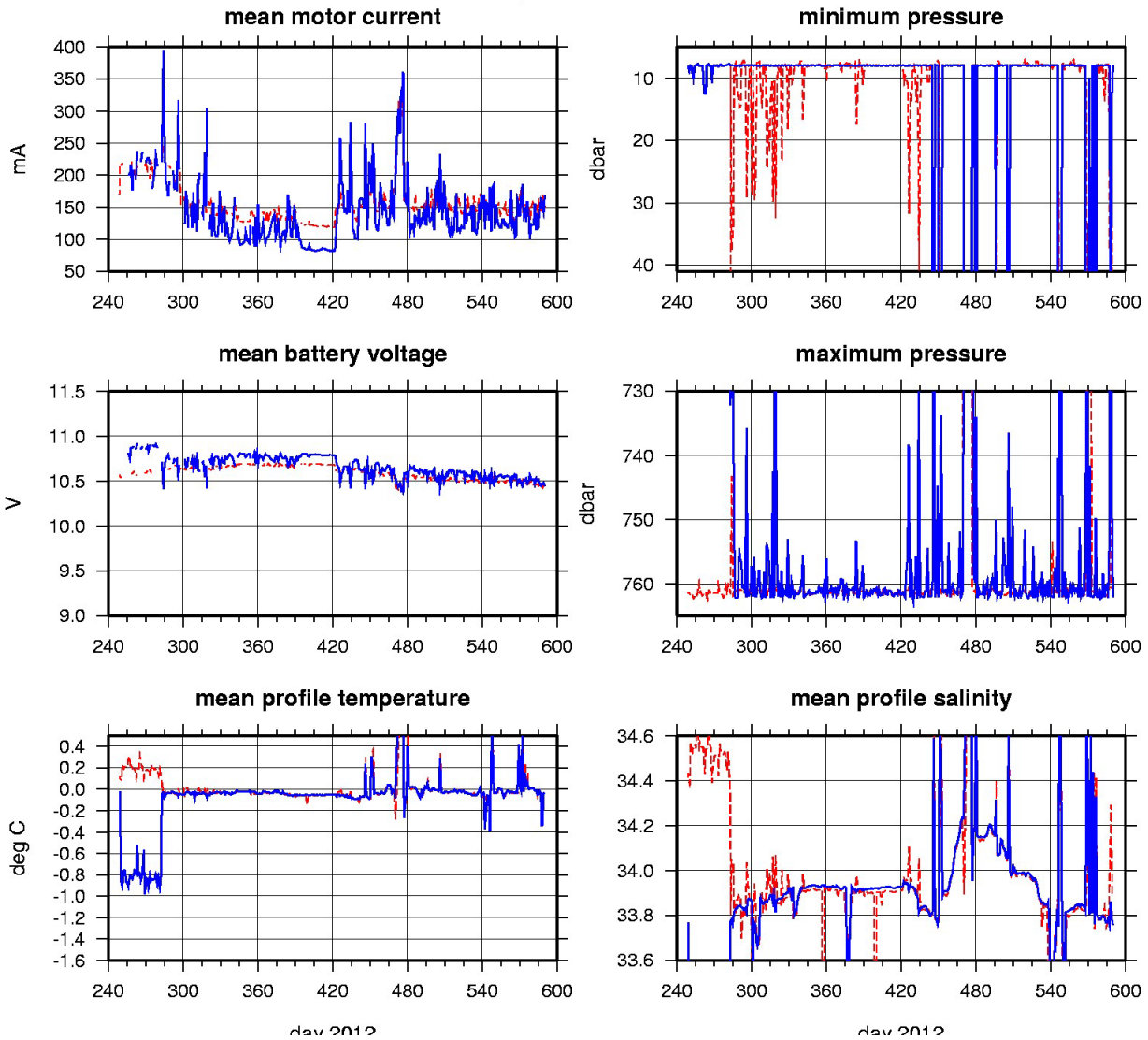
Level III 1-db bin-averaged processed profile data in ASCII format: `itp62final.tar.Z` or `itp62final.zip`

ITP62 Buoy Status (as of 2013/08/11)

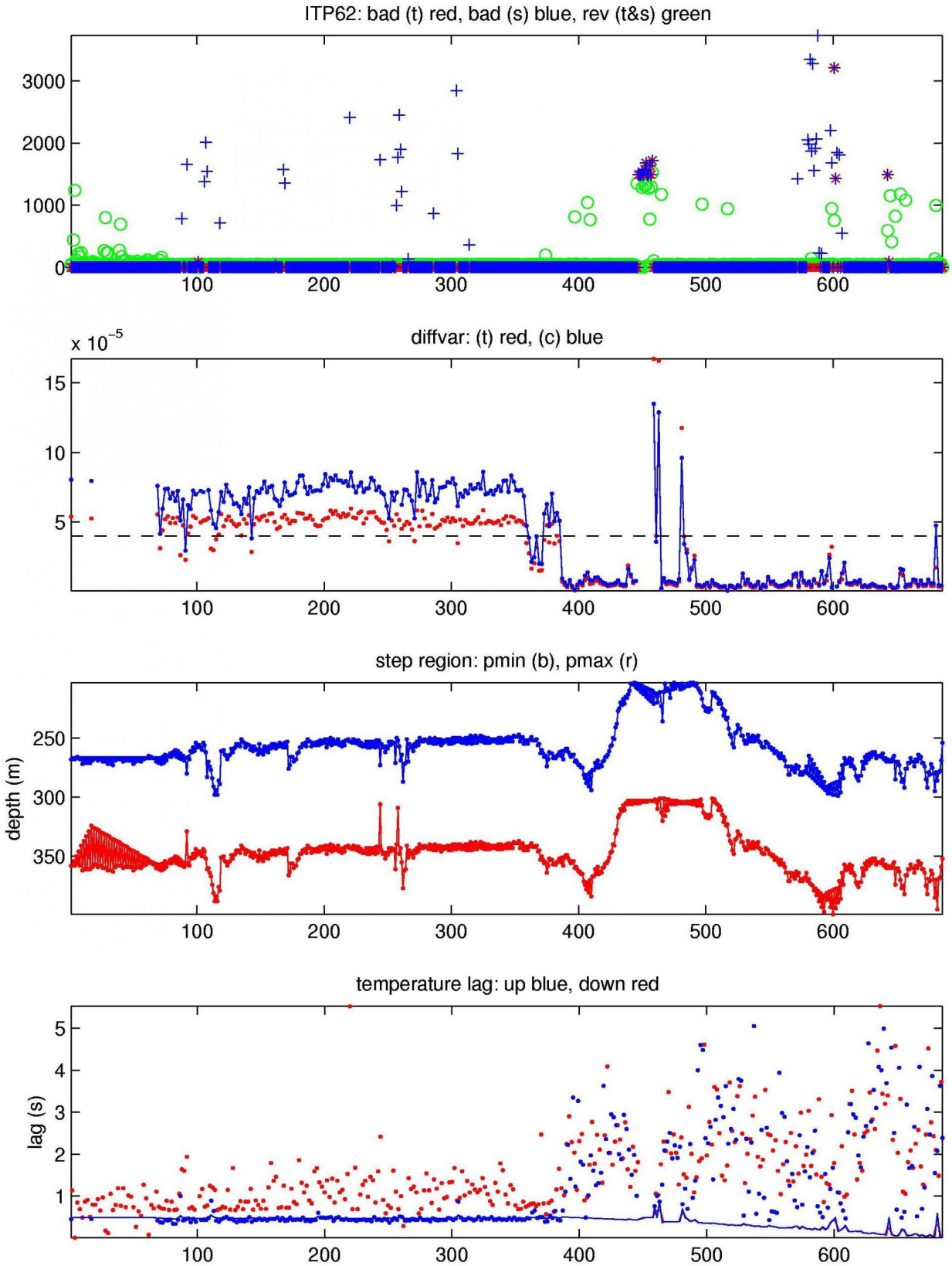


ITP62 Profiler Status (up to profile 686)

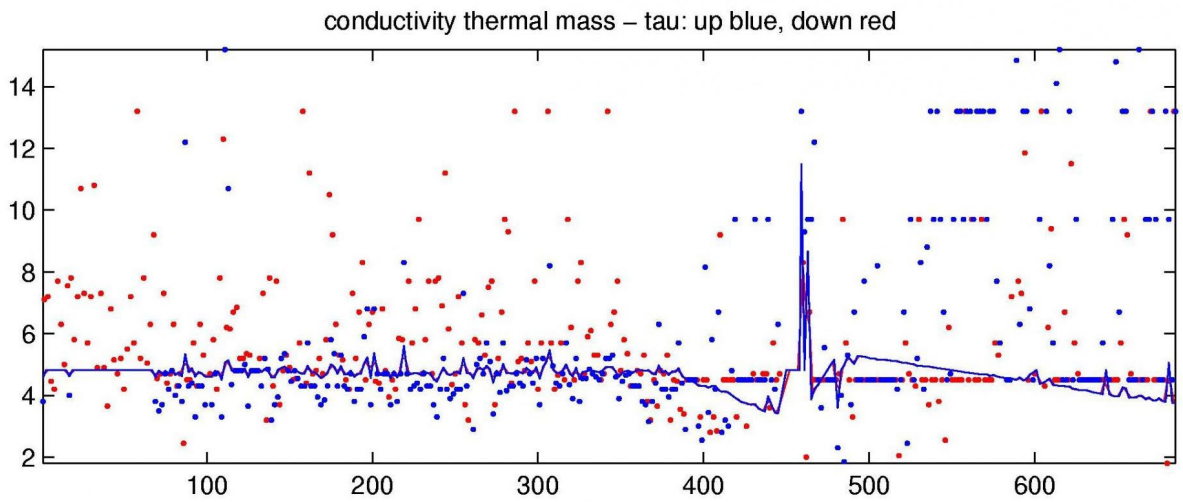
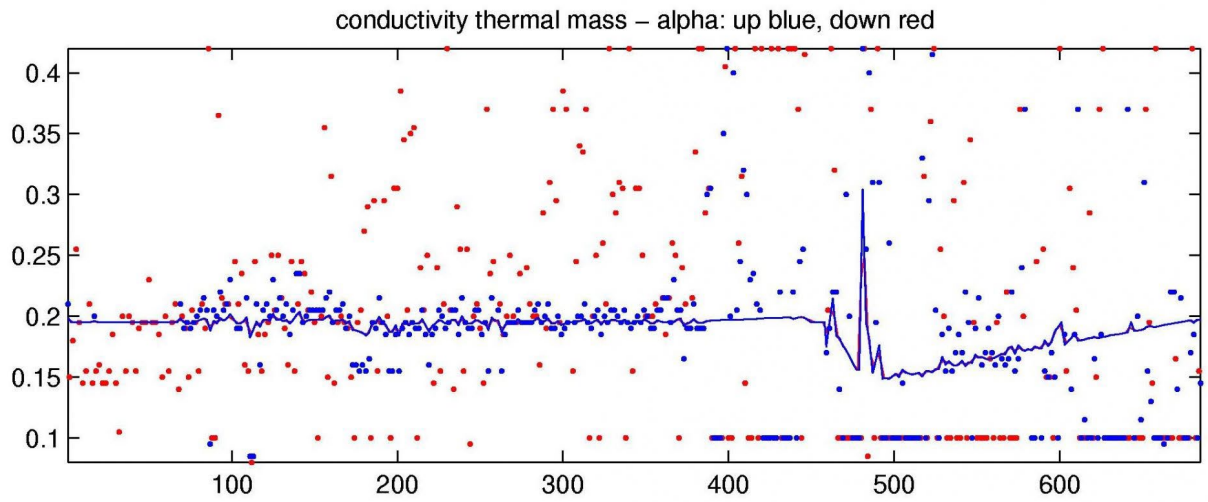
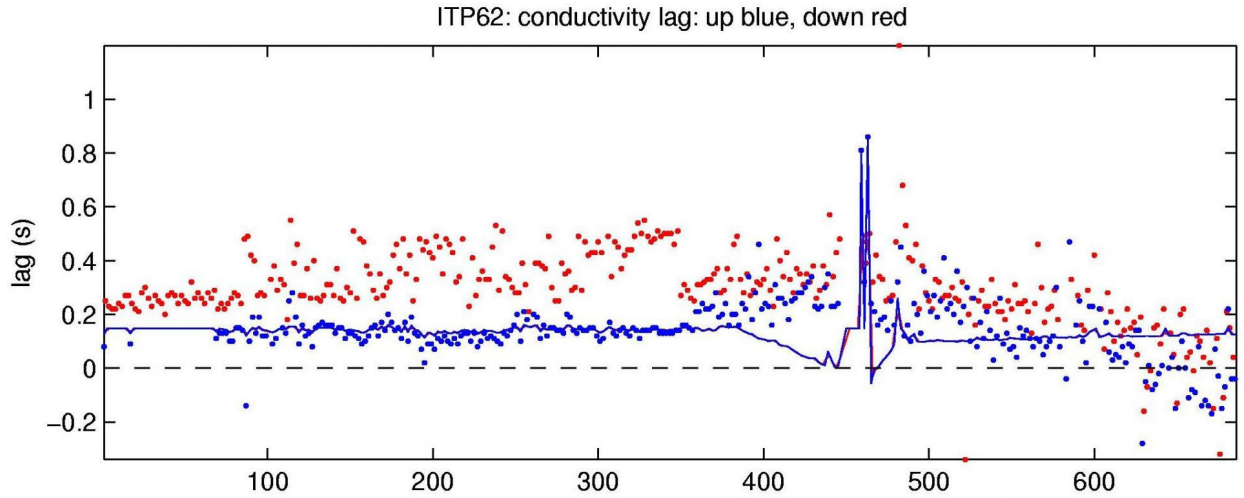
up solid, down dashed



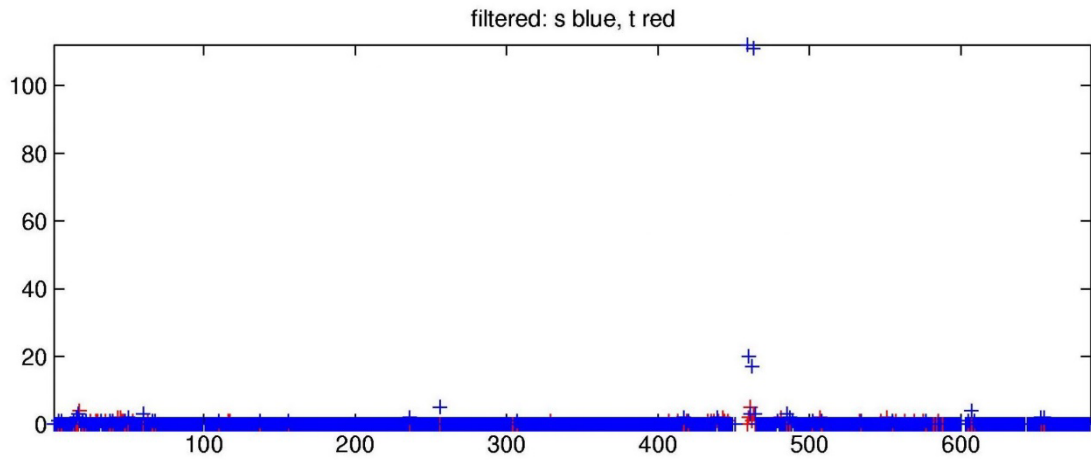
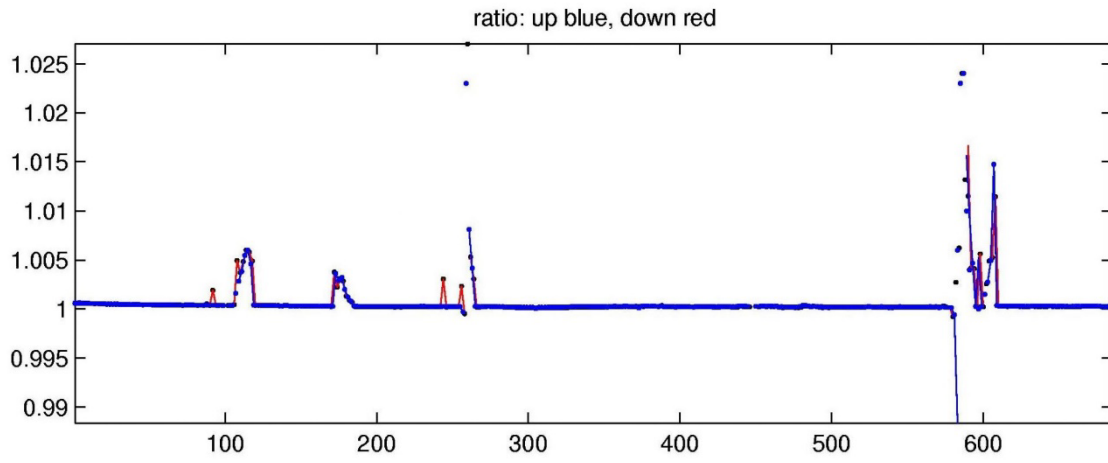
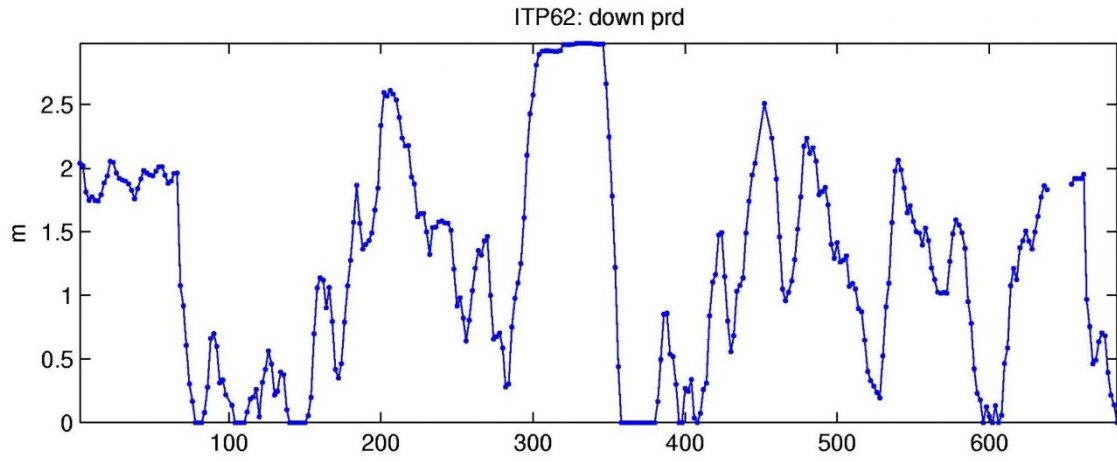
ITP Profiling Engineering Data



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

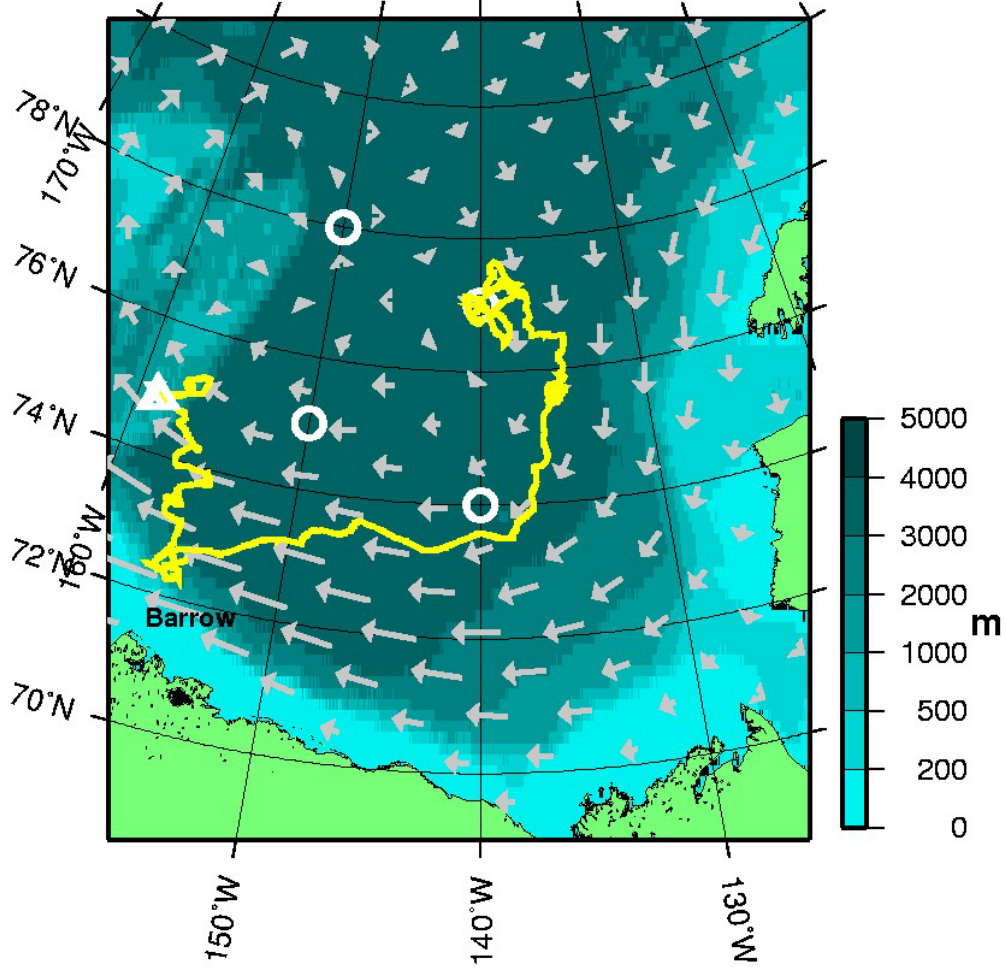


Top: conductivity lag, Middle: conductivity thermal mass amplitude correction, Bottom: conductivity thermal mass lag correction



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

ITP62 Drift Track (as of 2013/08/11)

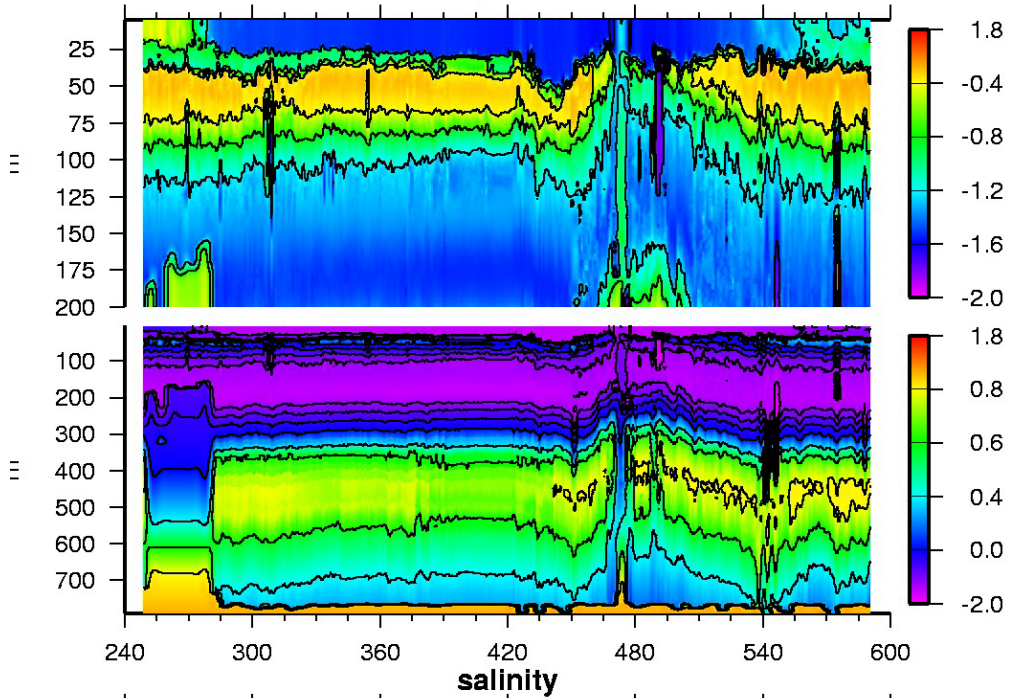


**ITP drift (yellow line) and last location (triangle),
BGOS moorings (white circles) and annual ice drift from
IABP (grey vectors) on IBCAO bathymetry (shading).**

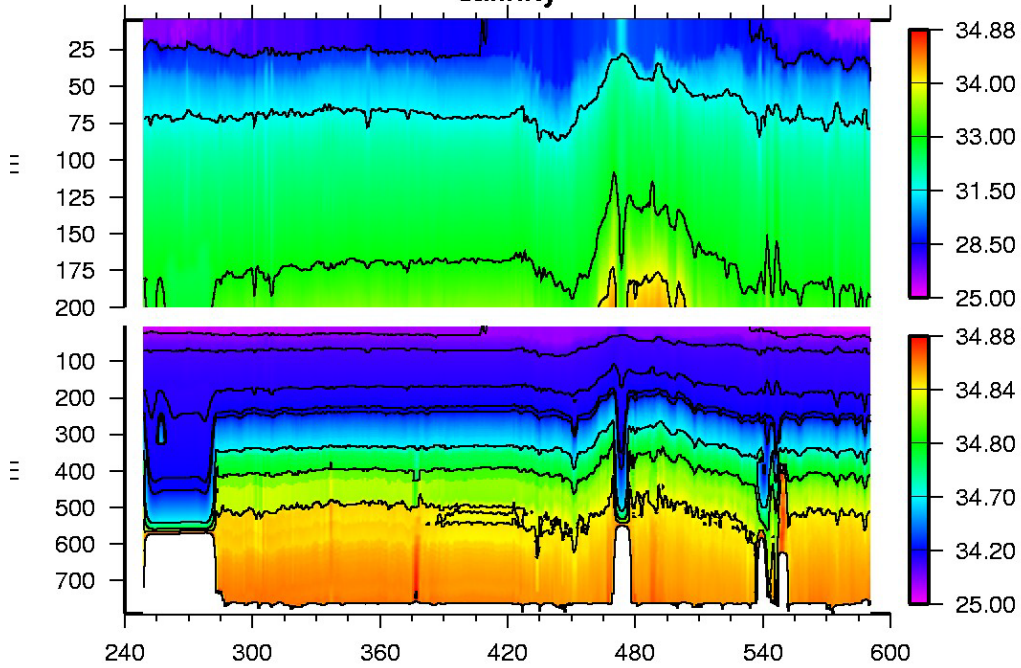
Plot of buoy locations.

ITP62 Up Profile Contours (to profile 686)

temperature



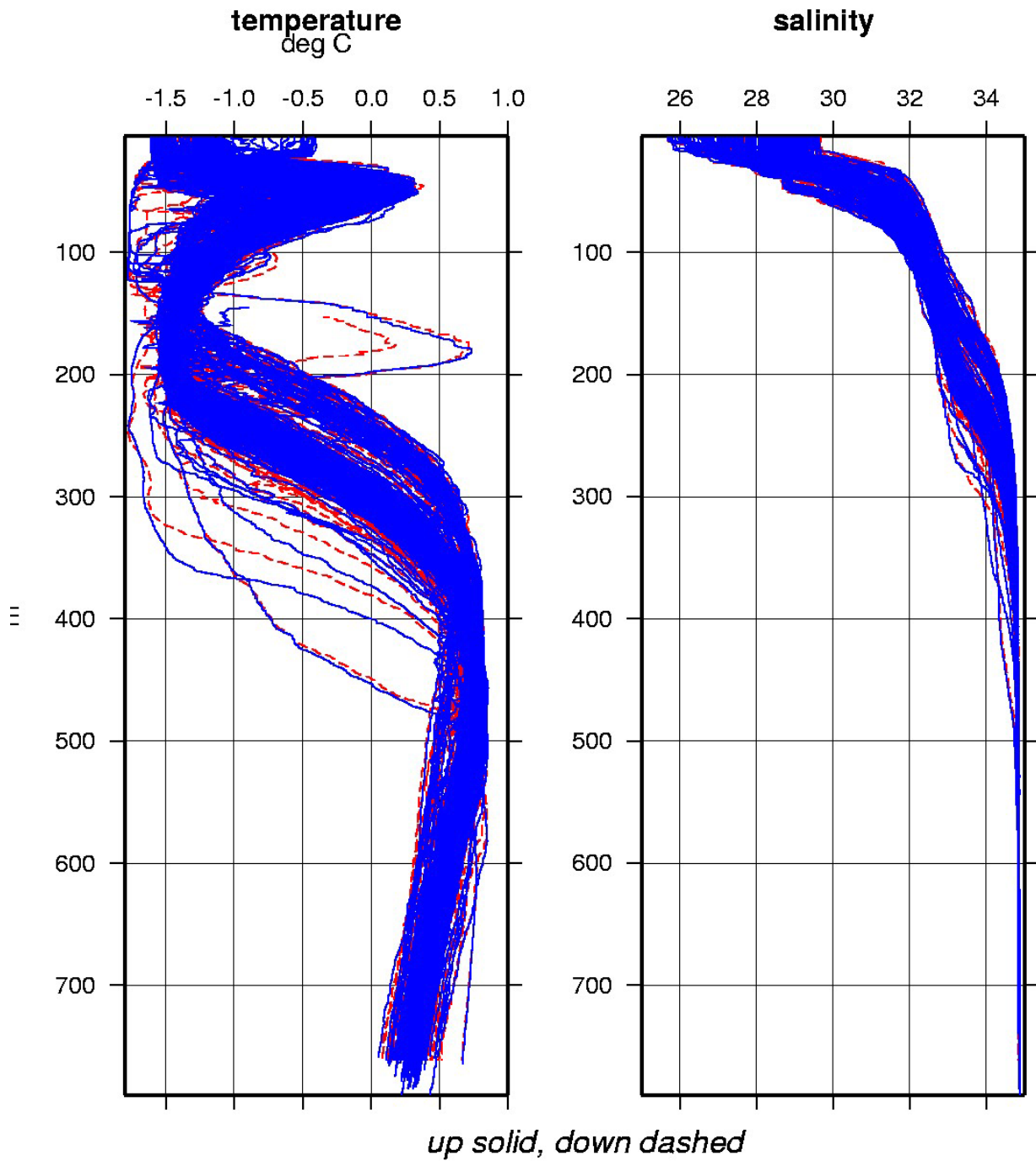
salinity



day 2012

ITP62 temperature and salinity contours.

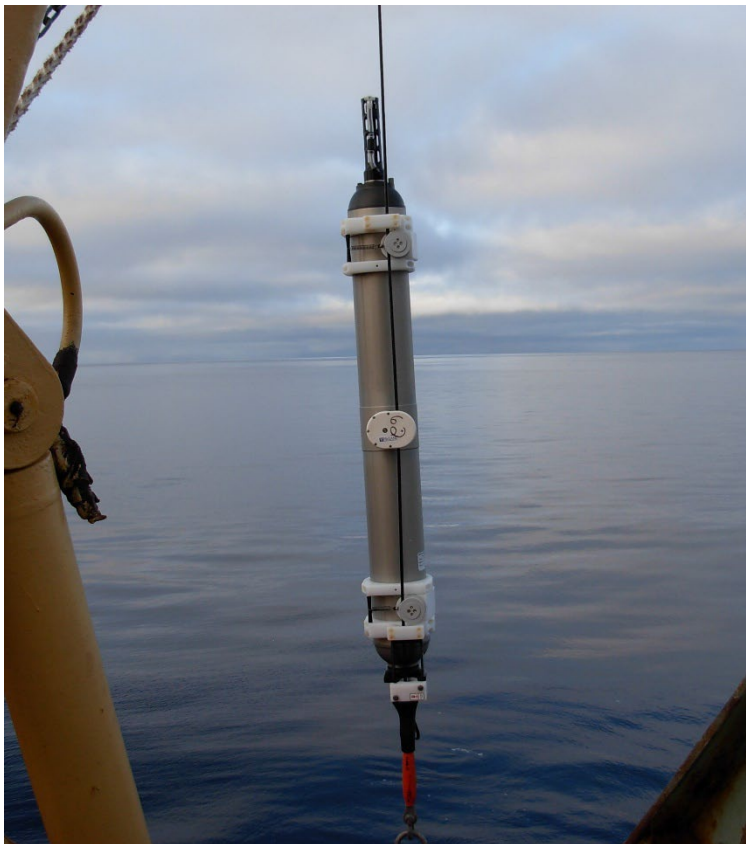
All ITP62 Profiles (up to profile 686)



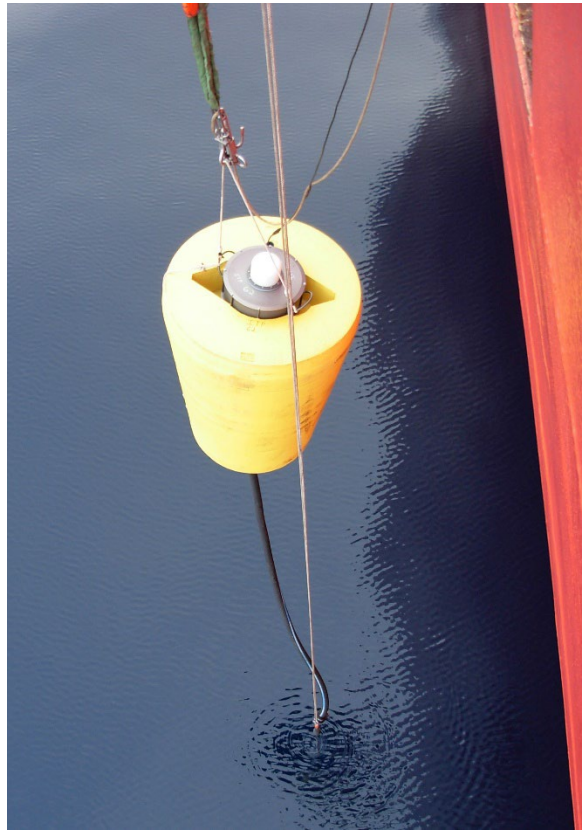
Composite plot of ITP temperature and salinity contours.



ITP 62 shortly after being deployed in open water over the side of the CCGS Louis S. St. Laurent in 2012. (Photo by Rick Krishfield)



With the mooring wire running through the A-frame block, ITP 62 profiler is maneuvered over the starboard side positioned on the bottom stop. (Photo by Rick Krishfield)



A slip line is used to transfer the tether load to the surface package just prior to releasing the system. (Photo by Rick Krishfield)



ITP 62 as deployed. (Photo by Steve Lambert)