

ITP30 Overview

Deployment Location: 8/12/2008, 16:00 UTC at 75° 54.6'N, 140° 36.9'W

Last Location: 4/28/2009, 23:00 UTC at 75° 59.4' N, 156°26.4' W

Duration: 259 days

Distance Traveled: 2886 km

Number of profiles: 9 in 4 days

Other instruments: SIMBA-A

ITP 30 was deployed on a 2.4 m thick ice floe in the Beaufort Sea as part of the Beaufort Gyre Observing System (BGOS) during the JOIS 2008 cruise on the CCGS Louis S. St. Laurent. On the same icefloe, a Scottish Association for Marine Science (SAMS) Ice Mass Balance Array (SIMBA A) was also installed. The ITP was configured with a FSI EMCTD and operated on a standard sampling schedule of 2 one-way profiles between 7 and 760 m depth each day.

ITP 30 Deployment Operations

The weather was excellent for the last ice station operation to deploy the last of five ITPs during the JOIS/BGOS cruise in 2008, ITP number 30. The site of the deployment was selected during an ice reconnaissance survey the previous afternoon, where this particular ice floe stood out from the very thin and ponded floes in the region. Overnight, while other shipboard science was being performed, the 2.4 m thick floe drifted only 5 miles, and was easily located the following morning. By this time of the cruise, the deployment operations had become extremely efficient. Consequently, the entire installation from the first helicopter flight with personnel and equipment to the site, to the concluding deployment of the surface package took only 1.5 hours, while other scientists concurrently obtain ice and upper ocean measurements from the floe, and the last SAMS ice mass balance buoy was deployed.

ITP30 Data Processing

The 8 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 ITP 30 are shown in the figures to the right. Despite the fact that the CTD head of this profiler included FSI sensors, the same processing procedures were utilized as with the Sea-Bird CTD heads, except that down pressures corrections were not applied, because the FSI sensors protrude from the side of the package, so are not subject to the wake of the instrument.

ITP30 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 only 4 days of reliable operation and data telemetry, the ITP surface package became unable to receive profile data from the profiler, even though the profiler continued to ring the surface package on schedule after every presumably successfully performed profile. It is suspected that either the inductive modem cable network became borderline, or surface inductive modem circuit failed. The surface package continued transmitting GPS locations and status for another 8 months until April 28 2009, when it suddenly stopped communicating.

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

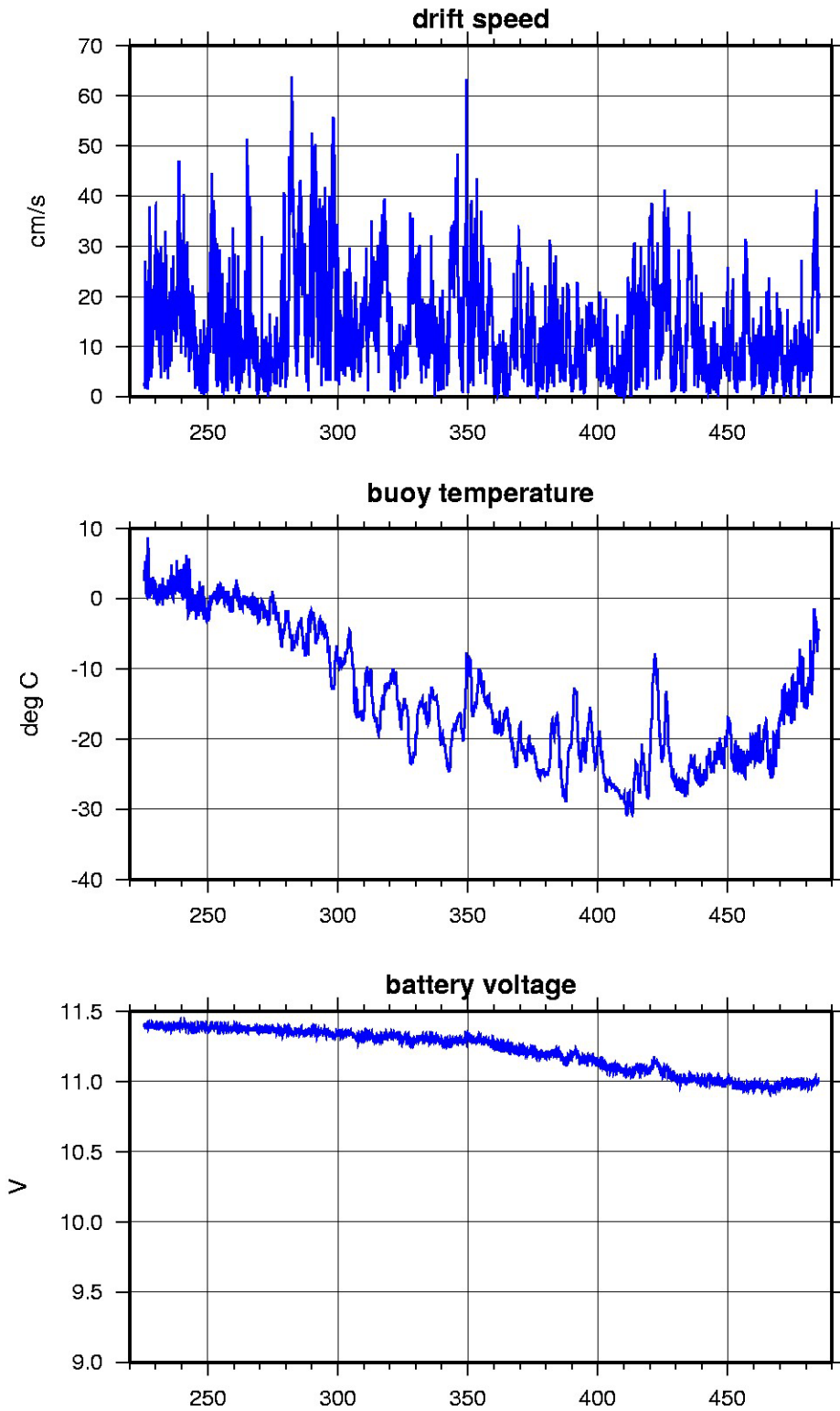
Level II hourly buoy location data in ASCII format: `itp30rawlocs.dat`

Level III 1-Hz processed profile data in MATLAB format: `itp30cormat.tar.Z` or `itp30cormat.zip`

Level III 1-db bin-averaged processed profile data in MATLAB format: `itp30final.mat`

Level III 1-db bin-averaged processed profile data in ASCII format: `itp30final.tar.Z`
or `itp30final.zip`

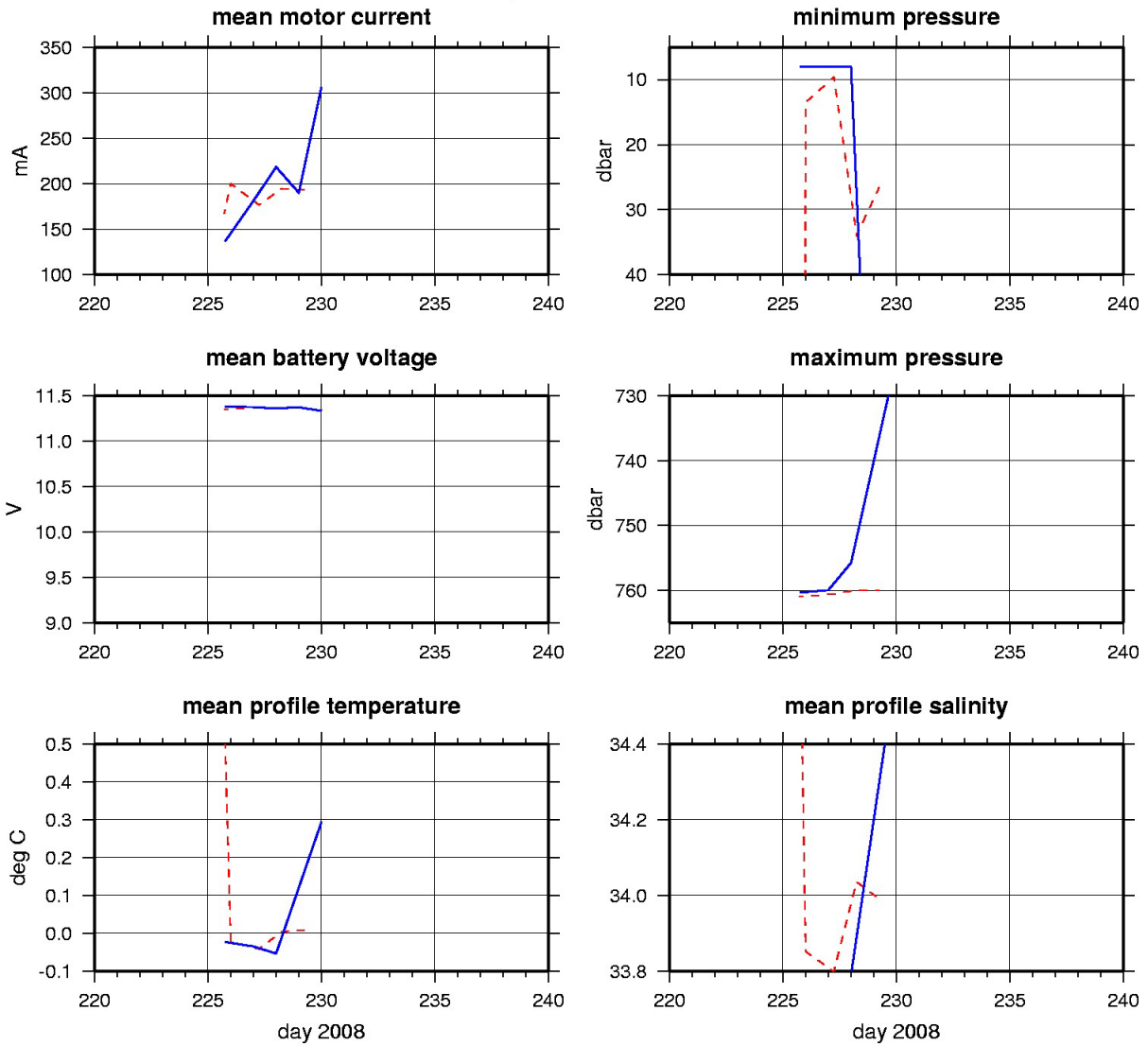
ITP30 Buoy Status (as of 2009/04/28)



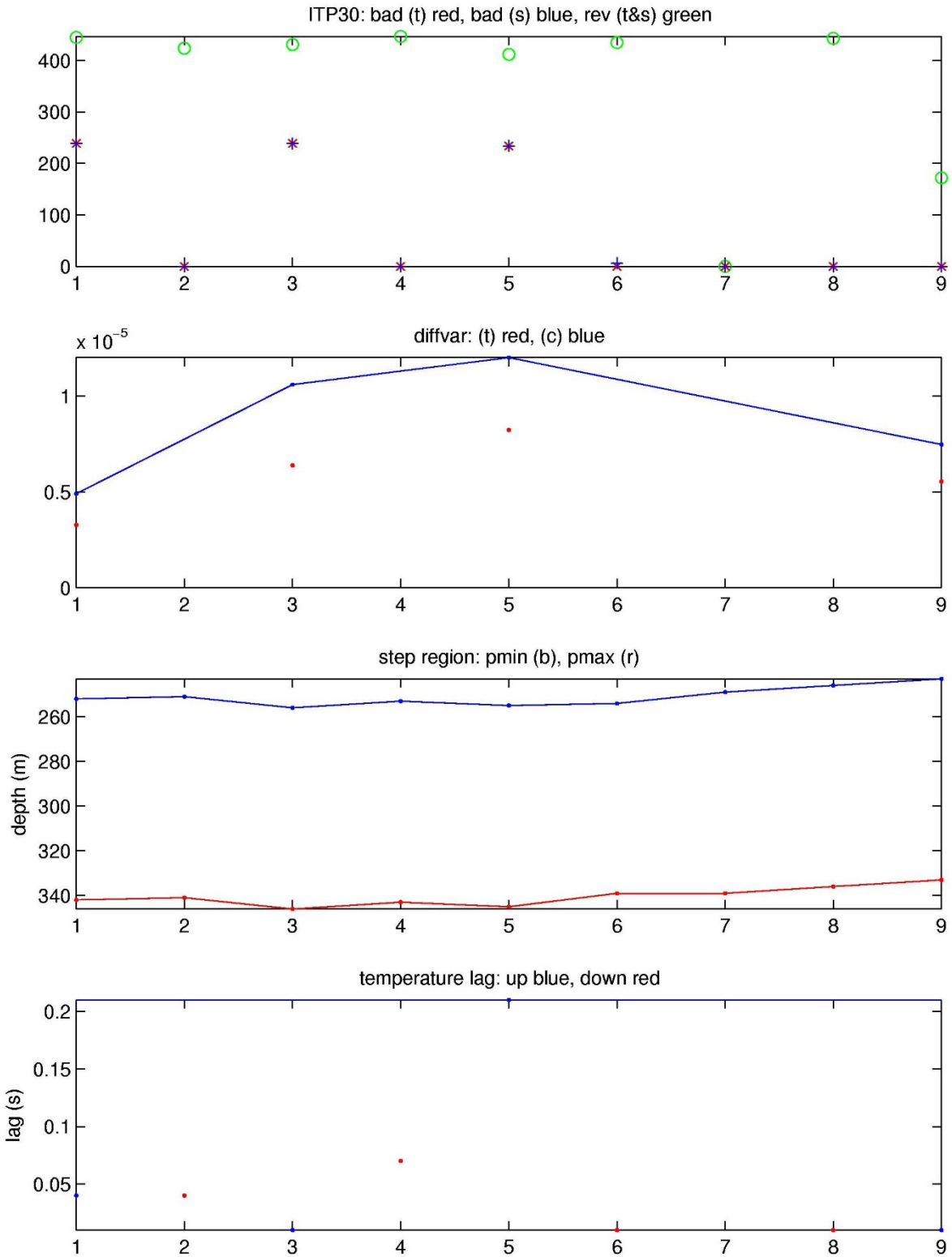
Nov 2008
ITP surface buoy status.

ITP30 Profiler Status (up to profile 9)

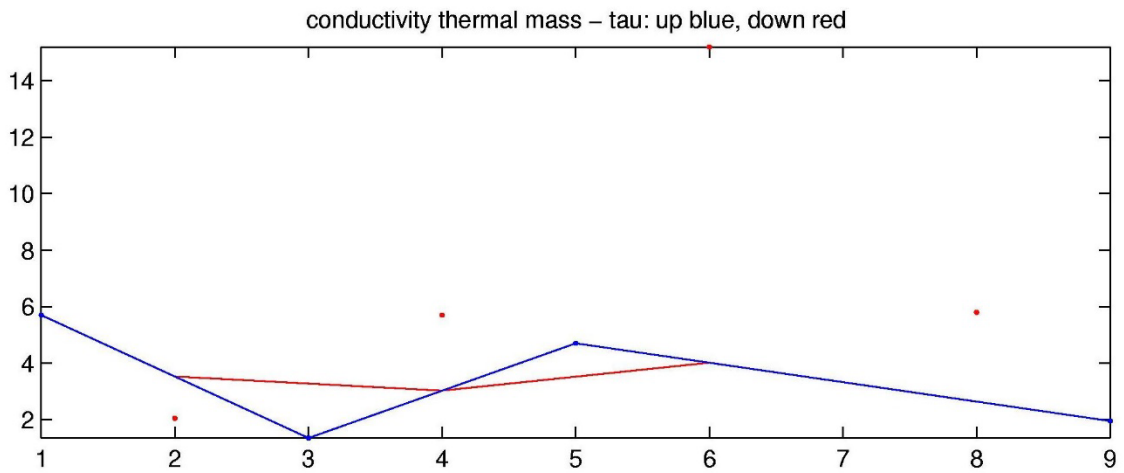
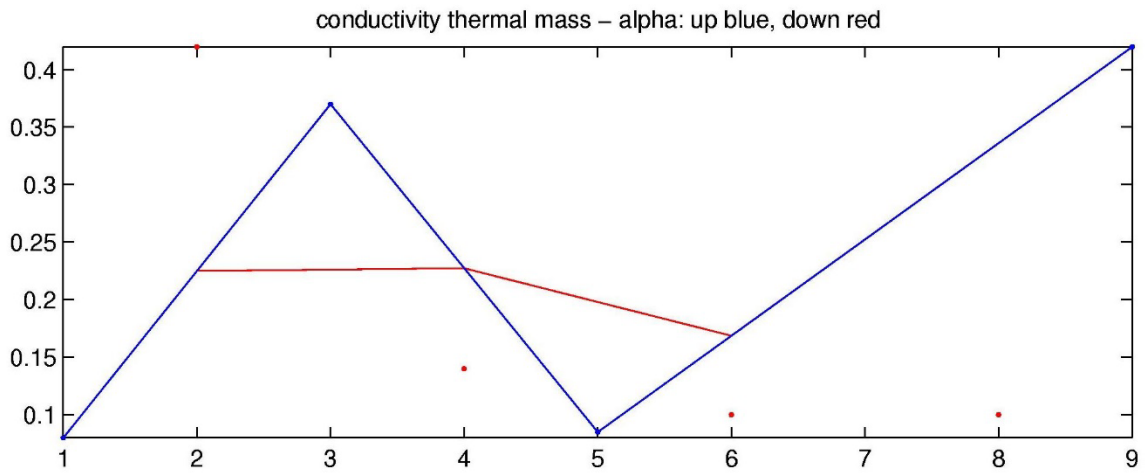
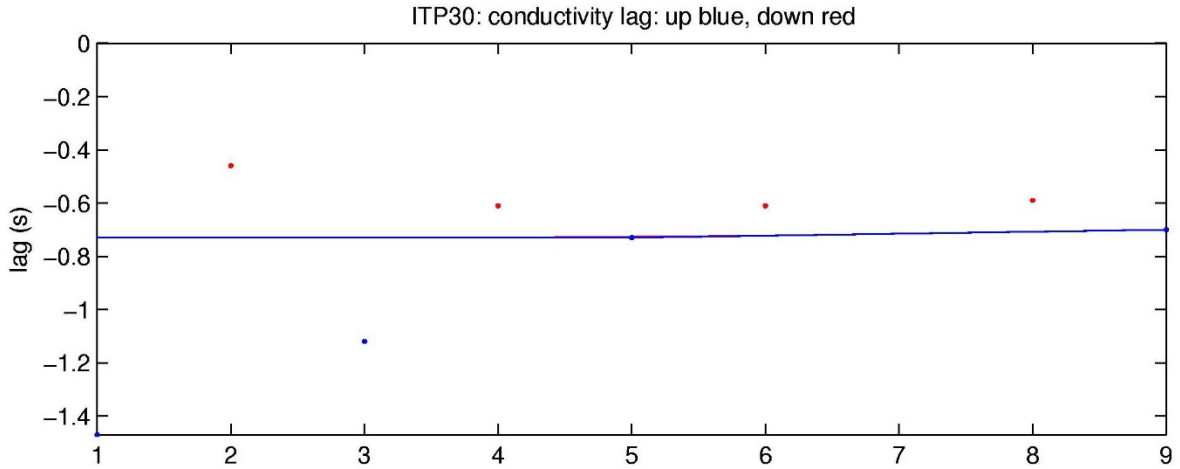
up solid, down dashed



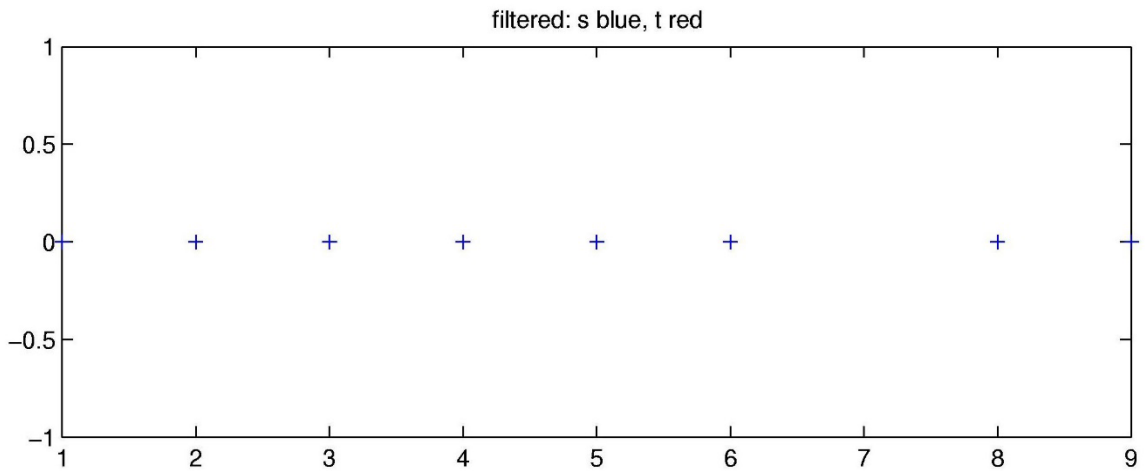
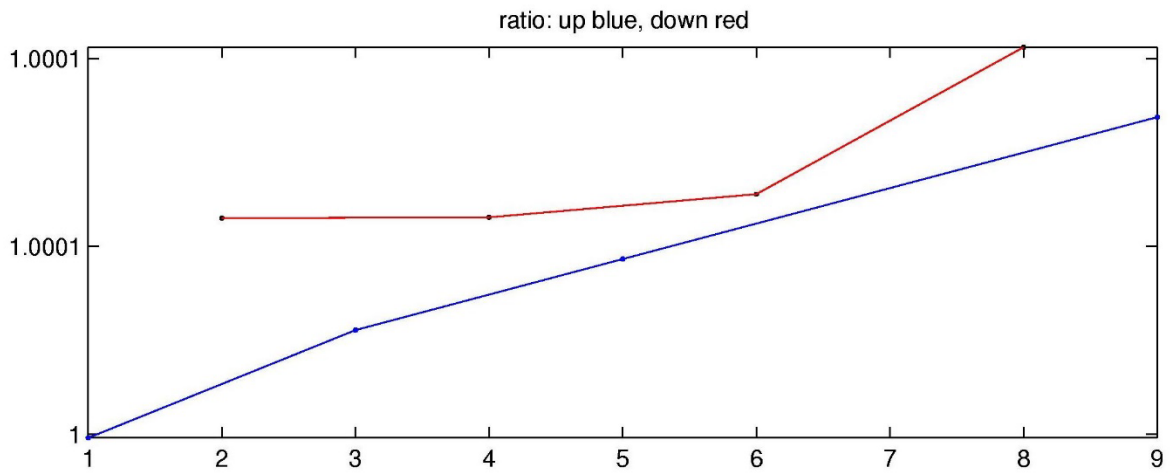
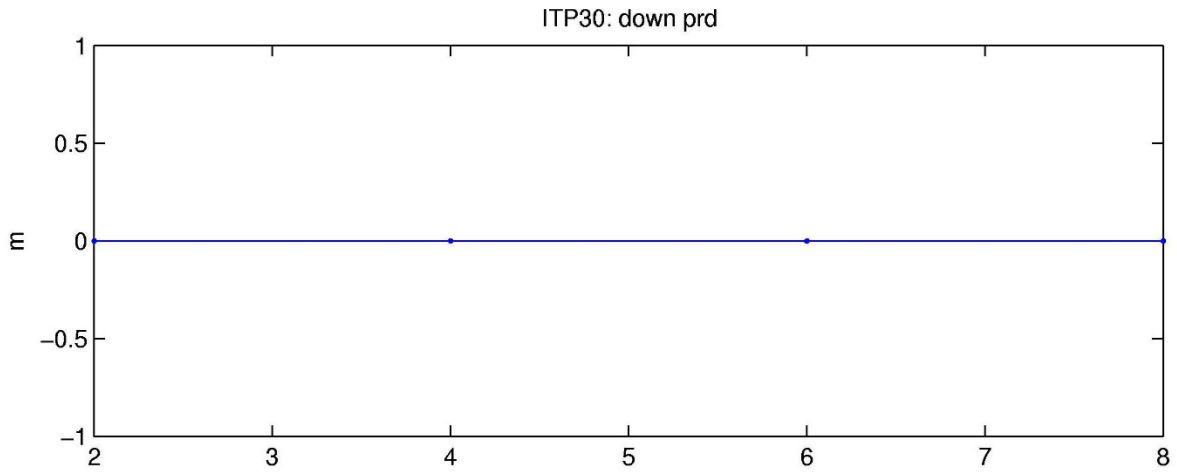
ITP profiler engineering data.



Number of bad points removed (top); variance of vertical difference of temperature and salinity in step region for up-going profiles; depth of staircase layer; temperature lag (bottom).

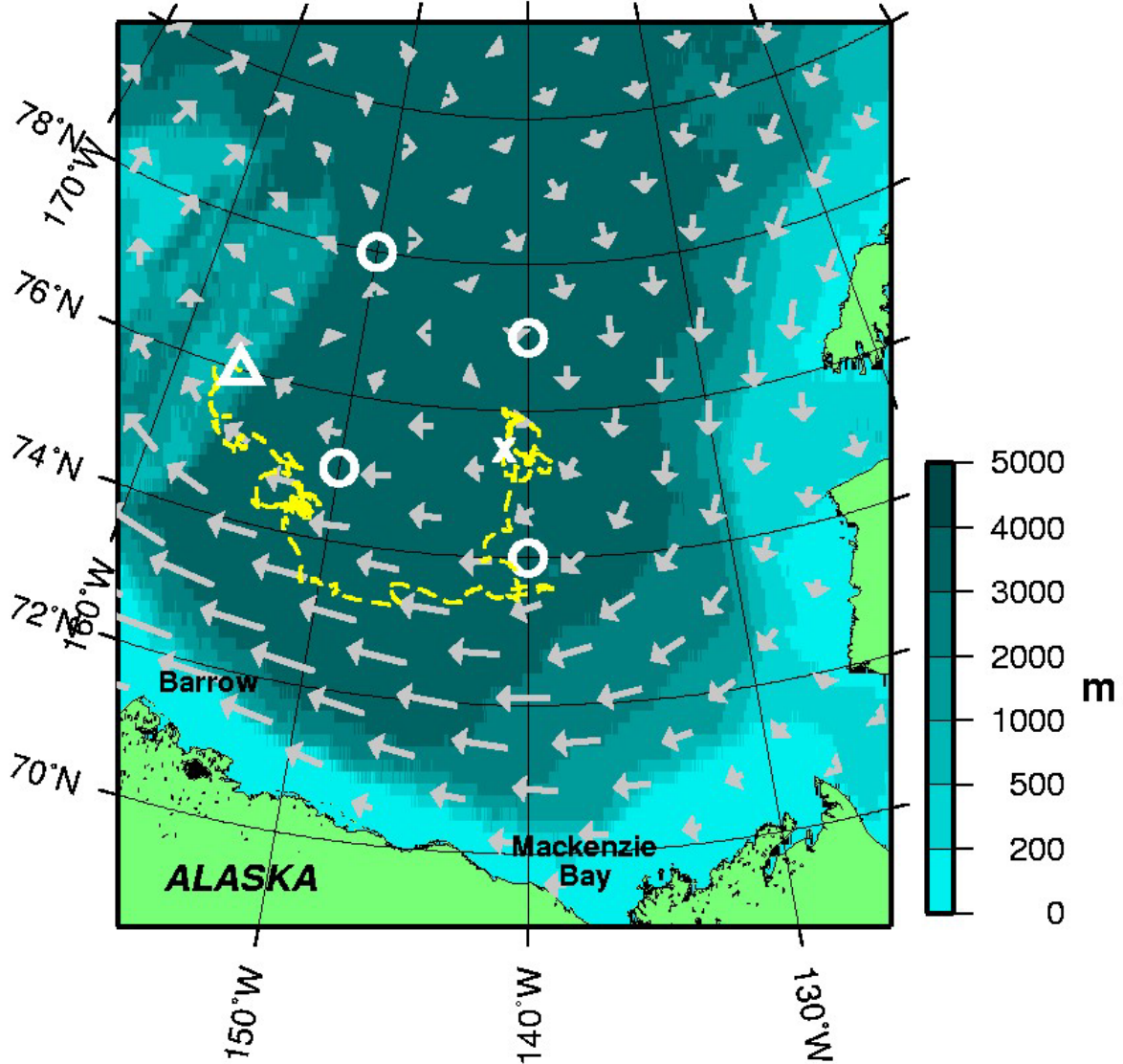


Top: conductivity lag, Middle: conductivity thermal mass amplitude correction, Bottom: conductivity thermal mass lag correction.



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

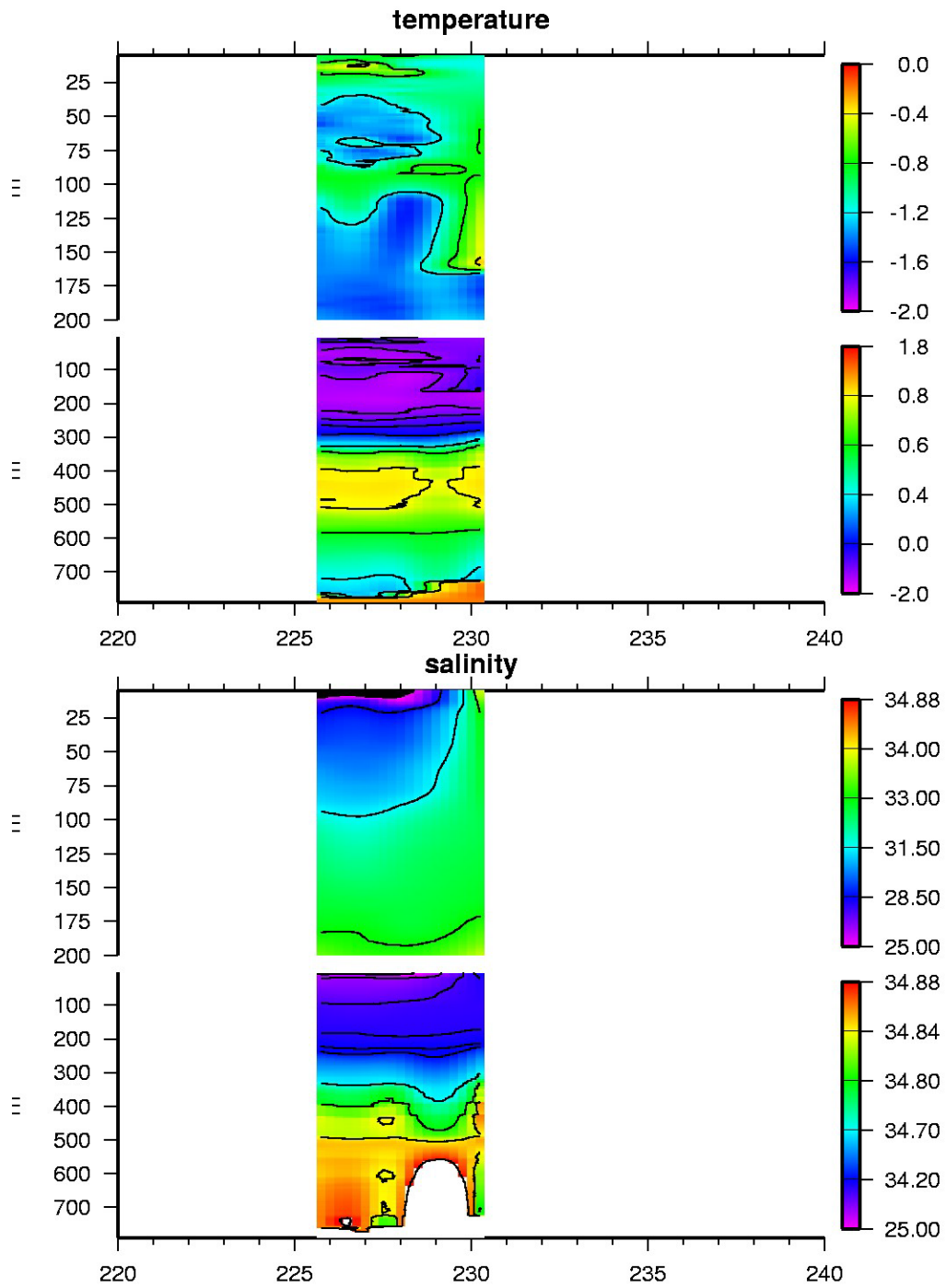
ITP30 Drift Track (as of 2009/04/28)



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

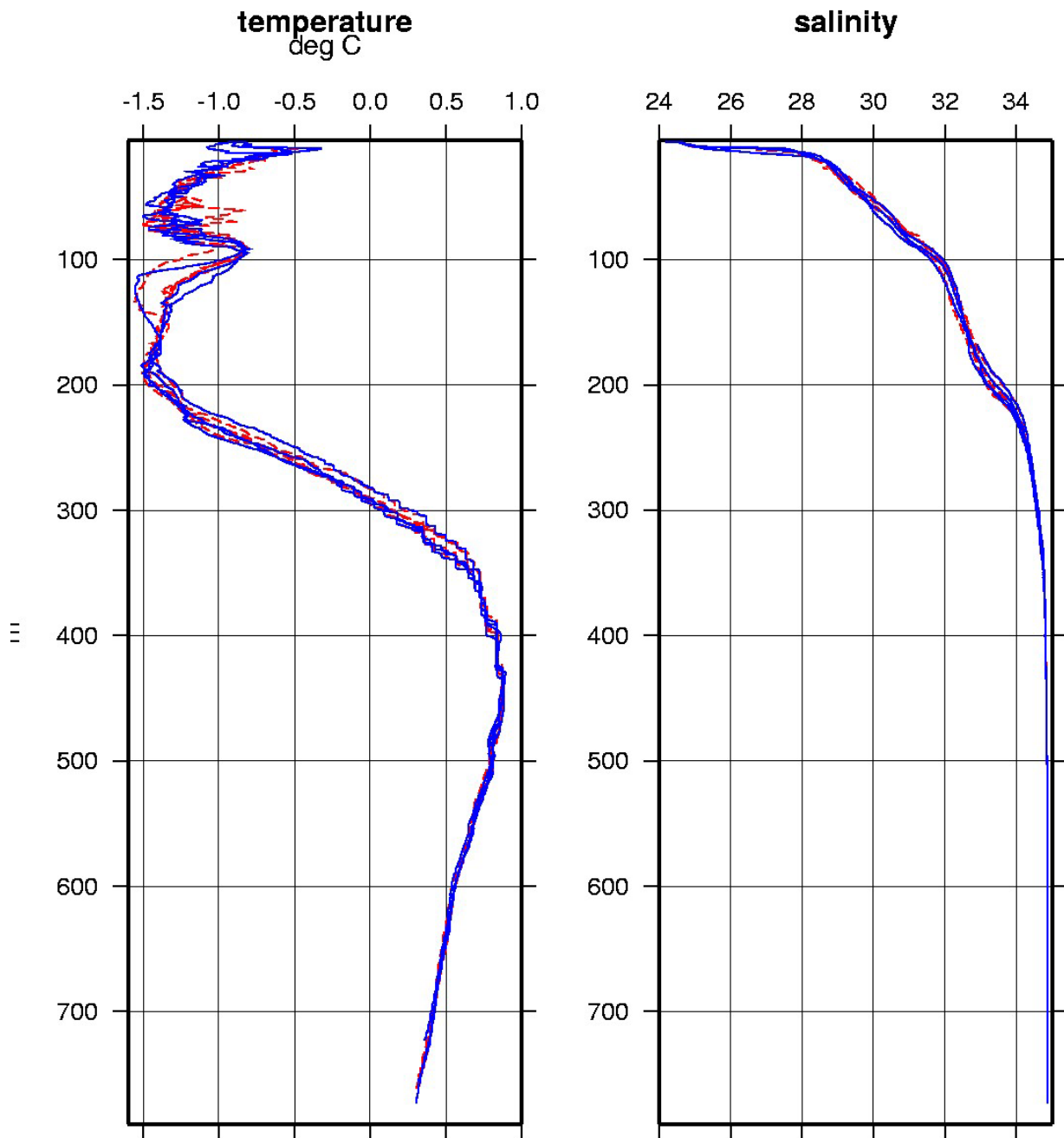
Plot of buoy locations.

ITP30 Up Profile Contours (to profile 9)



day 2008
ITP 30 Temperature and Salinity contours.

All ITP30 Profiles (up to profile 9)



up solid, down dashed

ITP 30 Temperature and Salinity contours.



On a beautiful summer day in the Beaufort Sea, ITP 30 surface package sits atop the ice shortly after deployment with the CCGS Louis S. St. Laurent away in the distance. (Photo by Rick Krishfield)



On this particular prototype ITP, the CTD sensors manufactured by FSI protrude from the side of the endcap, with the expectation that the wake effects of the instrument would be less. Here Rick Krishfield is lowering the package through the hole in the ice floe. (Photo by Gary Morgan)