

KESS Recovery Cruise Report
June 1 - July 5, 2006
R/V Melville

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1 Introduction

1.1 Summary Overview

1.2 Hydrography Summary

1.3 ADCP Summary

Two hull-mounted doppler sonar systems measured upper-ocean currents during the cruise. Here we report the performance for the 150 kHz RD Instruments narrowband and the 75 kHz RD Instruments Ocean Surveyor.

University of Hawaii data acquisition software (UHDAS) recorded single ping data for both instruments. In addition, data were processed and displayed in near real time. Processing entailed the following operations: edit and average single-ping data into 5-minute profiles, plot the latest 5-minute averages, and perform full CODAS processing on the averaged data (including an Ashtech rotation that corrects the gyrocompass heading) every 2 hours. Data gaps were minimal. The longest acquisition gap was about 1.5 hours long and took place on June 30 at 10:52 GMT. Both data sets begin June 1 and end July 7. Each data set has 3 cruise directories because the UHDAS system was restarted twice during the cruise (June 13 1:45 GMT and July 1 11:00 GMT) due to hang-ups in the near-real time plot displays or loss of Ashtech acquisition. RDI 150 configuration was 8-m blank and pulse and 50 8-m bins. Speed of sound correction was temperature dependent. Typically good velocity data reached 300 m depth. RDI OS75 configuration was 16-m blank and pulse and 70 16-m bins. Speed of sound correction was temperature dependent. Typically good velocity data reached 700 m depth. Information about UH data acquisition and CODAS processing may be found on the web site currents.soest.hawaii.edu. The two systems compare well (Fig. 15). Post-processing will concatenate the three databases for each into one database for each instrument.

The Ashtech was flaky on the R/V Melville and needed to be restarted on 3 occasions. The longest gap in Ashtech acquisition began on June 16 near 2:30 GMT and lasted for 0.98 days. Fig. 16 shows a histogram of the length of gaps in the Ashtech acquisition. Typically gaps were less than 5 minutes in duration.

1.4 NOAA Surface Drifter Summary

As part of NOAA's global surface drifter program, we deployed 5 drifters aboard the R/V Melville. The deployments were separated as evenly as possible in space and time and were subject to the ever changing cruise plan. The surface drifters measure sea surface temperature and pressure. It floats in the water and is powered by batteries located in the dome. The drifter data that are collected including location with a GPS, are sent to a satellite and then to a land station where we can all access the data. These drifters combined with the Argo floats should provide a good Lagrangian description of the Kuroshio Extension region.

2 Tables

2.1 Hydrography

Site	SN	Sampling Y/N	CTD Station #	CTD Cast	Yrday. Ref 2004	Max Dist Start(km)	Max Dist Bottom(km)
S1	36		1	1	883	0.4516	0.4536
S2	43		2	1	883	0.2941	0.2916
I1	163		3	1	884	0.136	0.0245
E5	143	NO	NA	NA	890		
F4	142	NO	44	1	890		
G4	109	NO	45	1	890		
F5	158		46	1	891	0.0115	0.0043
E6	156	NO	47	1	891		
E7	170		48	1	891	1.9853	0.8817
E7	110	NO	48	1	891		
F6	174		49	1	892	0.0285	0.0234
G5	149	NO	50	1	892		
H6	166		51	1	893	0.004	0.0015
H5	168	NO	52	1	893		
H4	132	NO	53	1	894		
G3	138	NO	54	1	894		
H3	112	NO	55	1	894		
H2	118		56	1	894	3.6077	2.207
G2	119	NO	57	1	895		
G1	115	NO	58	1	895		
F2	102	NO	59	1	895		
E3	121		60	1	896	0.2629	2.9922
E2	162		61	1	896	1.8942	0.3634
E1	122		62	1	897	1.0015	2.8195

Table 1: Table of Sites and calibration CTD deployments with maximum distance from the site at the start of CTD deployment and maximum distance from the site when the CTD reached the bottom

Site	SN	Sampling Y/N	CTD Station #	CTD Cast	Yrday. Ref 2004	Max Dist Start(km)	Max Dist Bottom(km)
D1	157	NO	63	1	897		
D2	155		64	1	898	3.3532	1.7933
C1	153	NO	65	1	898		
B1	151	NO	66	1	898		
B2	152	NO	67	1	899		
C2	68		68	1	899	1.8481	1.1876
D3	104	NO	69	1	900	2.5911	0.5781
C3	63		70	1	900	0.0336	0.0419
C3	124	70		1	900	0.0119	0.0241
B3	148		71	1	901	0.0782	0.0728
B4	164	NO	72	1	901		
A2	145		73	1	901	2.1317	1.9304
N1	45	NO	74	1	902		
N1	160		74	1	902		
B5	167	NO	75	1	902		
C6	173		76	1	903	0.057	1.6633
D6	101	NO	77	1	903		
D5	111	NO	78	1	904		
C5	116		79	1	904	1.885	1.4349
C5	171	NO	79	1	904		
C4	144	NO	80	1	904	0.1754	0.9734
D4	105		81	1	905	0.0785	0.0758
E4	137		82	1	906	2.2968	2.3005
F3	147		83	1	906	1.6705	0.7838
F3	134	NO	83	1	906		

Table 2: Continuation of Table 1

2.2 NOAA Surface Drifters

ID #	Date	Time (Z)	Launch Latit (N)	Launch Long (E)
63079	06/04/2006	22:12	35 47.91	144 55.36
63080	06/05/2006	04:19	35 41.60	144 38.56
63078	06/06/2006	15:06	35 33.43	144 40.32
63081	06/14/2006	18:42	33 12.11	144 6.910
63077	06/06/2006	07:08	35 48.05	144 58.40

Table 3: NOAA Surface Drifters deployments

2.3 XBT

SN	Date	Time (Z)	Launch Latit (N)	Launch Long (E)
09596	6/26/2006	06:31	35 50.61	145 30.16
09593	6/26/2006	10:32	36 36.08	145 54.90
09594	6/30/2006	21:27	34 20.91	143 30.26
09589	6/30/2006	23:25	34 09.52	143 17.09
09585	7/01/2006	01:30	34 26.24	143 18.32
09590	7/02/2006	01:52	35 54.97	144 33.65
09586	7/02/2006	04:28	36 09.18	144 44.77
09587	7/02/2006	13:12	36 43.57	145 10.69
00000	7/03/2006	17:55	35 07.14	142 38.87
00000	7/03/2006	18:42	35 01.73	142 33.38
09592	7/03/2006	19:30	34 56.14	142 27.49
09588	7/03/2006	20:15	34 51.07	142 22.14
09861	7/03/2006	21:15	34 46.56	142 14.71
09538	7/03/2006	22:15	34 50.92	142 05.33
09862	7/04/2006	00:45	34 57.34	141 50.89

Table 4: XBT deployments

2.4 CPIES/PIES Sites

Site	SN	τ/p (Start)	τ/p (End)	u/v (Start)	u/v (End)	Launch (GMT)	Recovery (GMT)	Lat	Lon	D (m)
A2	145	5/27/04	6/20/06	5/27/04	6/20/06	5/27/04	6/21/06	37 48.51	147 51.93	5689
B1	151	5/18/04	4/4/06	5/18/04	4/5/06	5/18/04	6/18/06	37 06.31	144 34.26	5568
B2	152	5/18/04	3/10/06	5/17/04	12/7/05	5/17/04	6/18/06	37 06.25	145 30.86	5425
B3	148	5/18/04	6/20/06	5/17/04	9/14/05	5/17/04	6/20/06	37 06.17	146 27.53	5596
B4*	164	5/18/04	12/2/05	NA	NA	5/17/04	6/20/06	37 06.15	147 24.22	5644
B5	167	5/26/04	12/6/05	5/25/04	12/7/05	5/25/04	6/22/06	37 06.08	148 20.91	5722
C1	153	5/19/04	12/10/05	5/18/04	11/13/05	5/18/04	6/17/06	36 21.11	144 05.44	5745
C2*	68	7/14/05	6/19/06	NA	NA	7/14/05	lost	36 20.89	145 3.19	5761
C3	124	5/13/04	6/19/06	5/12/04	5/21/04	5/12/04	6/19/06	36 20.82	145 59.25	5567
C3*	63	7/12/05	6/19/06	NA	NA	7/11/05	6/19/06	36 20.81	145 59.27	5567
C4	144	5/17/04	5/2/06	5/16/04	5/3/06	5/16/04	6/23/06	36 20.78	146 55.25	5631
C5	171	5/25/04	12/24/04	5/25/04	12/27/04	5/25/04	6/23/06	36 20.75	145 53.17	5846
C5	116	6/29/05	6/23/06	6/28/05	6/23/06	6/28/05	6/23/06	36 20.79	147 53.19	5798
C6	173	5/26/04	6/22/06	5/25/04	4/24/06	5/25/04	6/22/06	36 20.73	148 51.08	5888
D1	157	5/19/04	12/18/05	5/18/04	12/19/05	5/18/04	6/16/06	35 25.99	143 31.22	5719
D2*	155	7/15/05	6/17/06	NA	NA	7/14/05	6/17/06	35 35.20	144 34.4	5765
D3	150	NA	NA	NA	NA	5/12/04	Abandoned	35 35.32	145 31.50	5849
D3	104	6/25/05	1/18/06	6/29/05	1/24/06	6/24/05	6/19/06	35 35.42	145 31.58	5849
D4*	105	5/16/04	6/24/06	NA	NA	5/16/04	6/24/06	35 35.28	146 26.97	5969
D5	111	5/17/04	10/6/05	5/16/04	10/7/05	5/16/04	6/23/06	35 35.24	147 24.24	5845
D6	101	6/29/05	2/19/06	6/29/05	2/21/06	6/29/05	6/22/06	35 35.21	148 21.47	5945
E1*	122	7/16/05	6/16/06	NA	NA	7/15/05	6/16/06	34 49.65	143 9.30	5305
E2	162	5/20/04	6/15/06	5/19/04	6/4/06	5/19/04	6/16/06	34 49.59	144 05.81	5754
E3	121	5/12/04	6/15/06	5/11/04	9/6/05	5/11/04	6/15/06	34 49.60	145 02.59	5885
E4*	137	7/12/05	6/25/06	NA	NA	7/12/05	6/25/06	34 49.6	145 59.6	5935
E5	143	5/16/04	8/20/05	5/15/04	8/21/05	5/15/04	6/9/06	34 49.25	146 55.68	5800

Table 5: Table of position information on CPIES/PIES Sites A2-E5. Depth values are approximate.

* indicates a site that was not a CPIES

Site	SN	τ/p (Start)	τ/p (End)	u/v (Start)	u/v (End)	Launch (GMT)	Recovery (GMT)	Lat	Lon	D (m)
E6	146	5/20/04	NA	5/20/04	NA	5/20/04	Abandoned	34 49.50	147 52.56	5943
E6	156	5/20/04	3/9/06	5/25/04	7/14/05	5/20/04	6/10/06	34 49.48	147 52.54	5943
E7	110	5/21/04	9/17/05	5/20/04	9/17/05	5/20/04	6/11/06	34 49.52	148 49.16	6110
E7*	170	7/7/05	6/11/06	NA	NA	7/6/05	6/11/06	34 49.50	148 49.22	6127
F2	102	6/26/05	11/4/05	6/25/05	11/5/05	6/25/05	6/15/06	33 55.15	144 37.37	5782
F3*	134	5/16/04	3/23/06	NA	NA	5/15/2004	6/25/06	34 00.61	145 30.28	5796
F3*	147	5/15/04	6/25/06	NA	NA	5/13/04	6/25/06	34 00.62	145 30.28	5815
F4	142	5/15/04	7/4/05	5/15/04	7/5/05	5/14/04	6/9/06	34 00.64	146 28.21	5847
F5	158	5/24/04	6/10/06	5/23/04	6/10/06	5/23/04	6/10/06	34 00.60	147 24.25	6034
F6	174	5/24/04	6/11/06	5/24/04	11/16/05	5/24/04	6/11/06	33 50.99	148 14.68	6196
G1	115	5/30/04	3/2/06	5/29/04	11/17/05	5/29/04	6/14/06	33 11.44	144 06.43	5465
G2	119	5/11/04	2/21/06	5/10/04	2/23/06	5/10/04	6/14/06	33 11.46	145 01.92	5800
G3	138	5/14/04	6/26/05	5/13/04	6/27/05	5/13/04	6/13/06	33 11.49	145 59.25	5733
G4	109	5/15/04	6/09/05	5/14/04	9/24/05	5/14/04	6/09/06	33 11.53	146 56.52	5949
G5	149	5/24/04	9/16/05	5/23/04	9/17/05	5/23/04	6/11/06	33 11.48	147 51.98	6233
H2	118	5/10/04	6/13/06	5/9/04	6/13/06	5/9/04	6/14/06	32 22.19	144 34.17	5695
H3	112	4/30/04	5/29/06	4/29/04	9/29/05	4/29/04	6/13/06	32 22.24	145 30.87	5845
H4	132	5/14/04	8/31/05	5/14/04	9/1/05	5/14/04	6/13/06	32 22.26	146 27.56	5957
H5	168	5/23/04	10/20/05	5/22/04	10/21/05	5/22/04	6/12/06	32 22.24	147 24.25	6035
H6	166	5/22/04	6/12/06	5/22/04	4/15/06	5/22/04	6/12/06	32 22.33	148 20.99	5744
I1	163	5/29/04	6/3/06	5/28/04	6/3/06	5/28/04	6/3/06	31 29.45	144 05.23	5869
N1	160	5/27/04	6/21/06	5/26/04	6/15/06	5/26/04	6/21/06	38 30.76	148 20.32	5687
N1	45	7/5/05	7/22/05	7/9/05	7/27/05	7/4/05	6/21/06	38 30.87	148 20.47	5703
S1	36	6/19/05	6/2/06	6/23/05	6/7/06	6/18/05	6/2/06	30 01.13	143 18.31	5867
S2	43	6/19/05	6/3/06	6/19/05	6/2/06	6/19/05	6/3/06	30 36.67	143 36.98	5691

Table 6: Table of position information on CPIES/PIES for Sites E6-S2. Depth values are approximate. * indicates a site that was not a CPIES

3 Figures

3.1 CPIES/PIES Data

3.1.1 Map of CPIES/PIES Sites

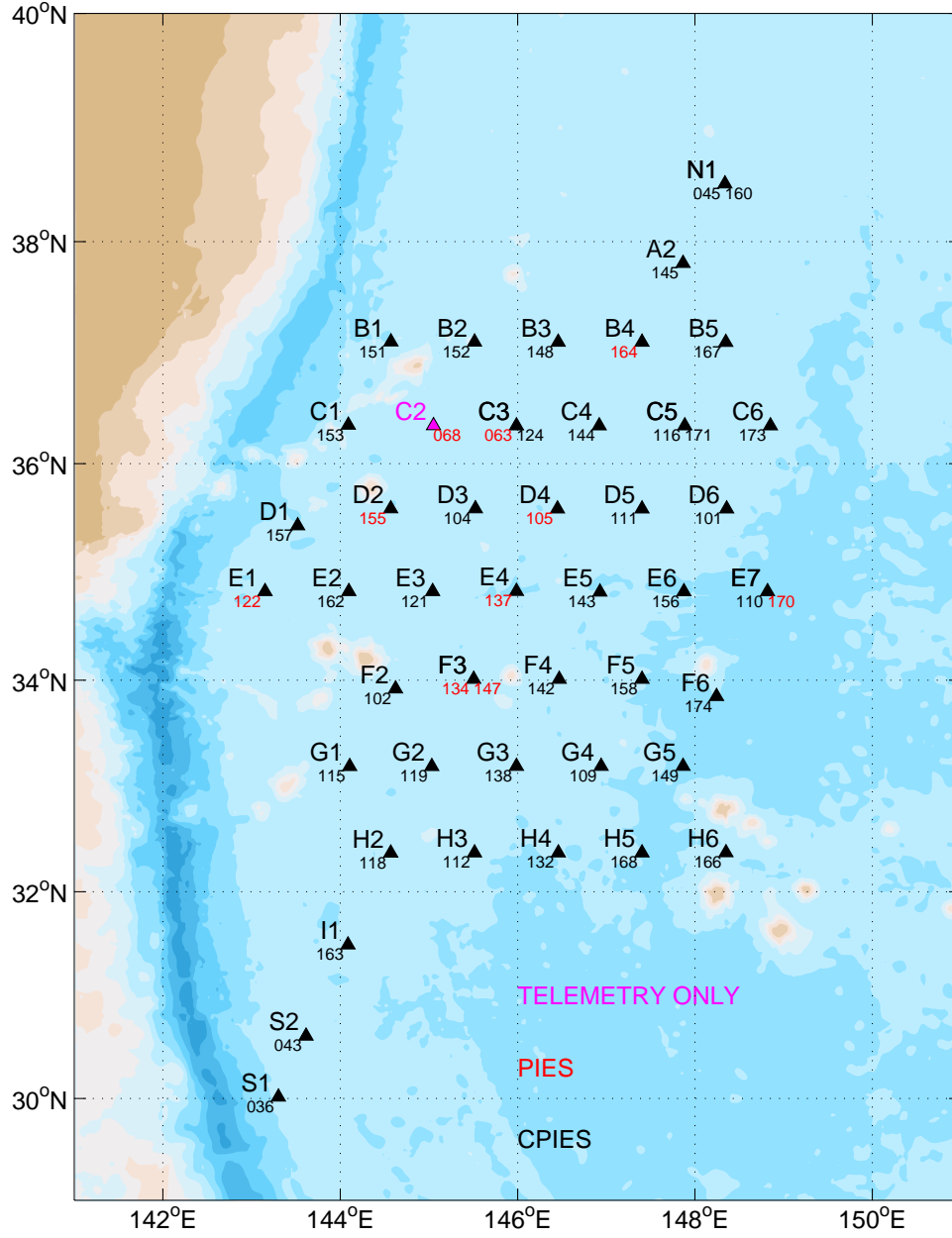


Figure 1: KESS Array superimposed on Smith & Sandwell bathymetry contoured every 1000m. Site reference in the upper left hand corner. IES SN#'s under the triangle. Magenta specifying sites where only telemetry was taken, red for PIES sites, and black for CPIES.

3.1.2 Tau

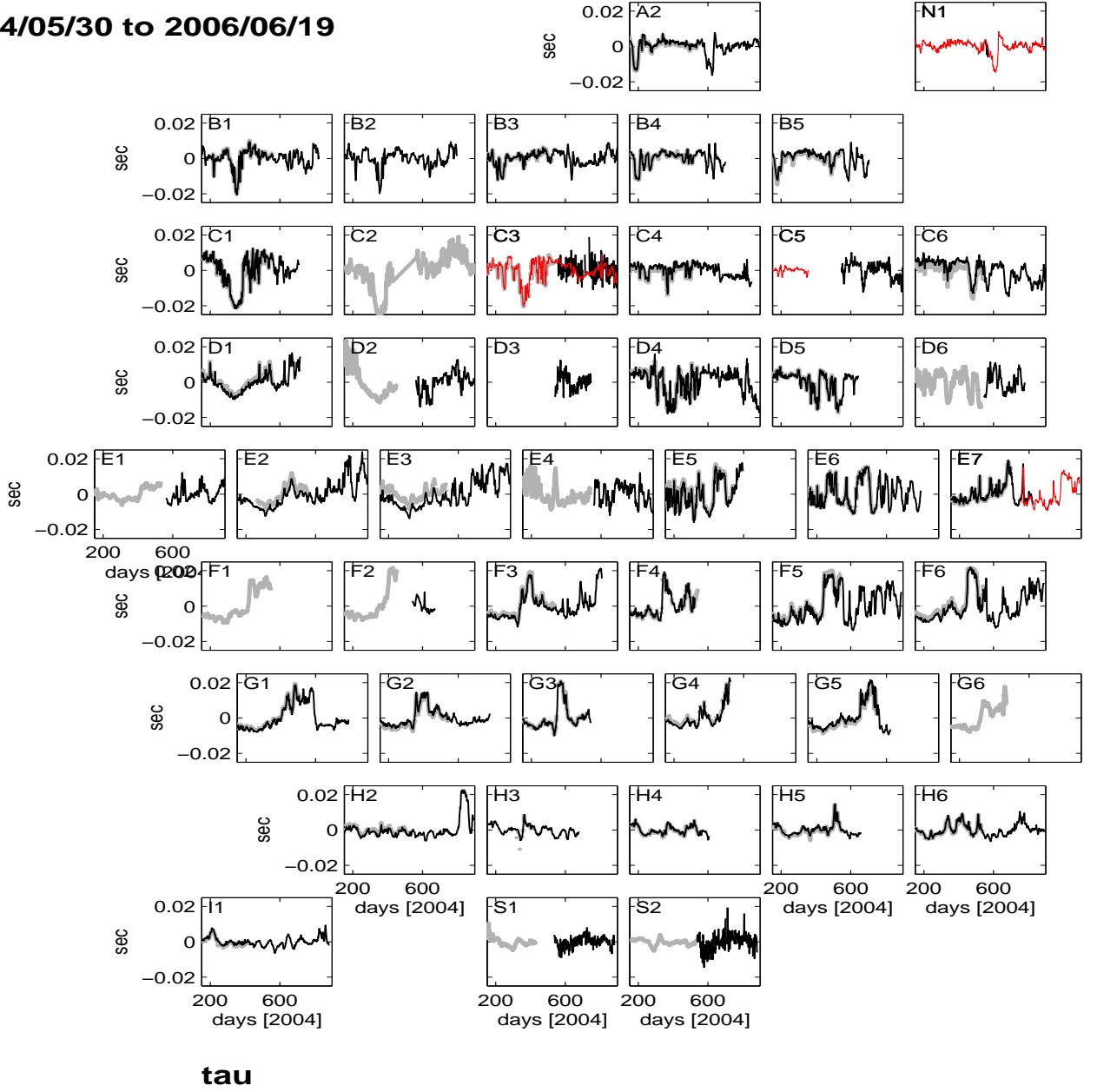


Figure 2: Time series 5/30/2004 – 6/19/2006 of τ in seconds according to approximate geographic location. Site number noted in the upper left corner of each subplot.

3.1.3 Bottom Pressure

2004/05/30 to 2006/06/19

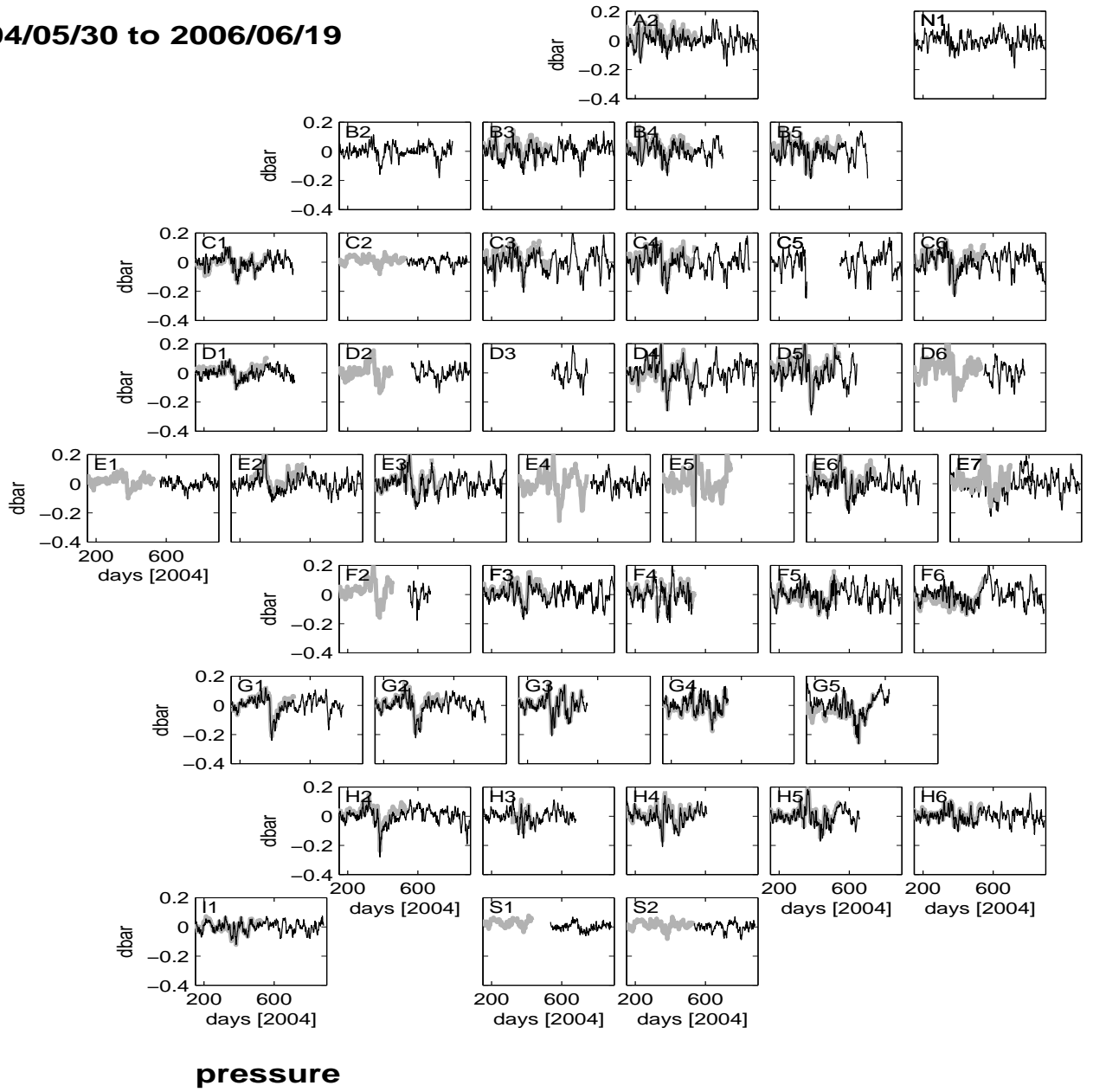


Figure 3: Time series 5/30/2004 – 6/19/2006 of bottom pressure in dbars according to approximate geographic location. Site number noted in the upper left corner of each subplot.

3.1.4 Bottom Currents

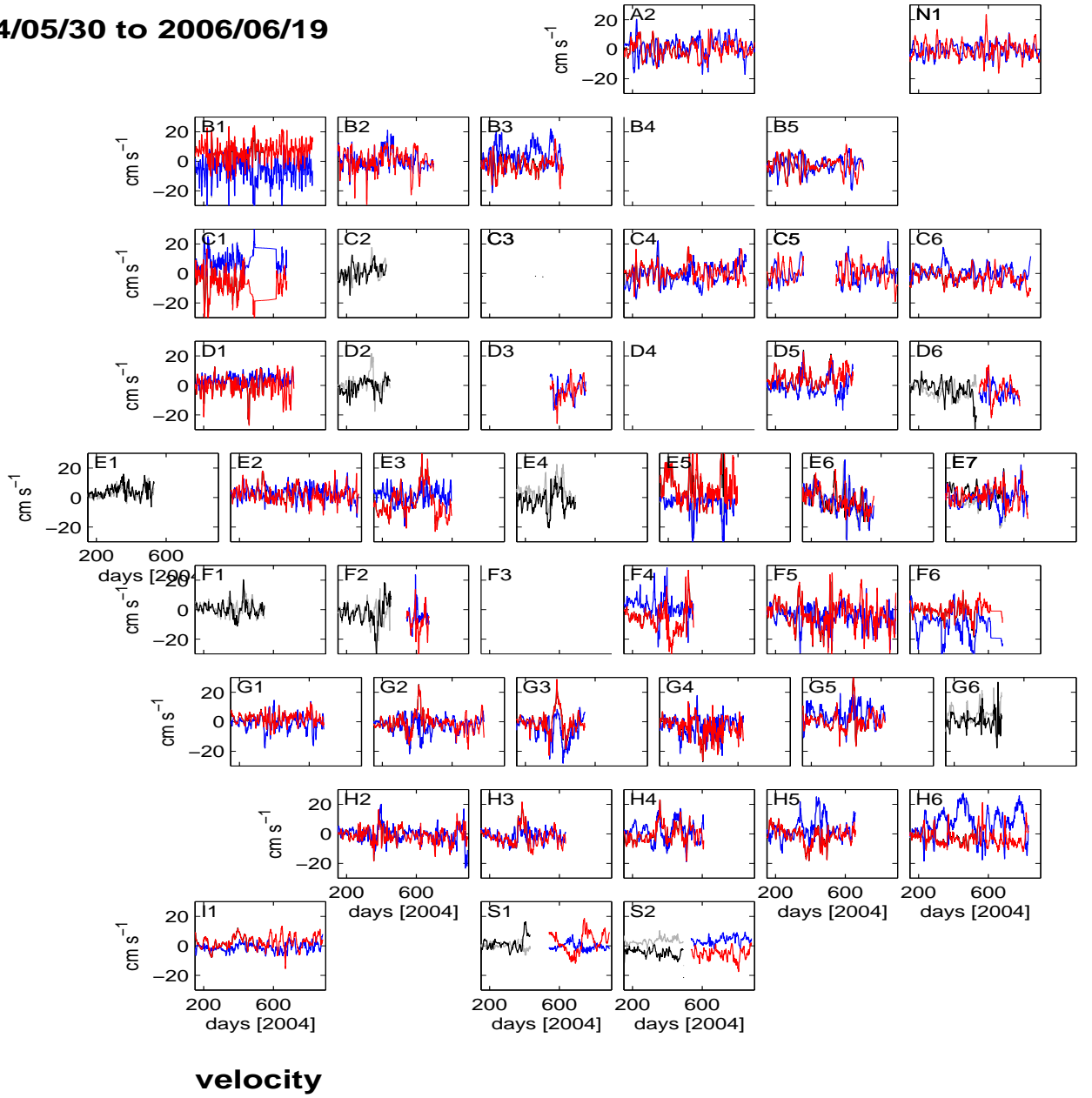


Figure 4: Time series 5/30/2004 – 6/19/2006 of bottom currents, u and v , in (cm s^{-1}) plotted according to approximate geographic location. Site number noted in the upper left corner of each subplot.

3.2 CTD

3.2.1 Map of CTD Stations

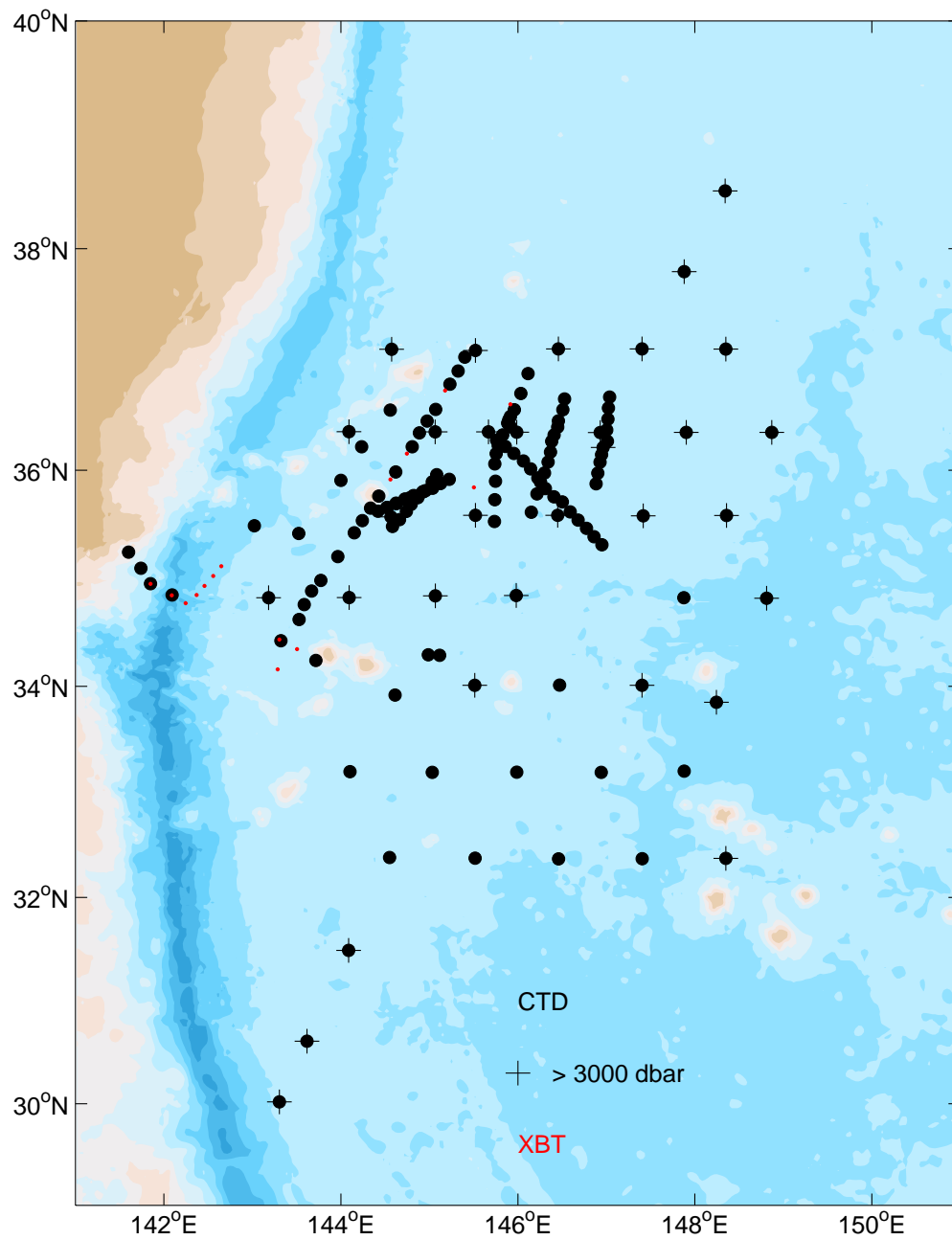


Figure 5: Map of CTD stations superimposed on Smith & Sandwell bathymetry contoured every 1000m. + indicating locations of deep CTD casts and red indicating locations of XBT casts.

3.3 Feature Survey 1

3.3.1 Potential Temperature

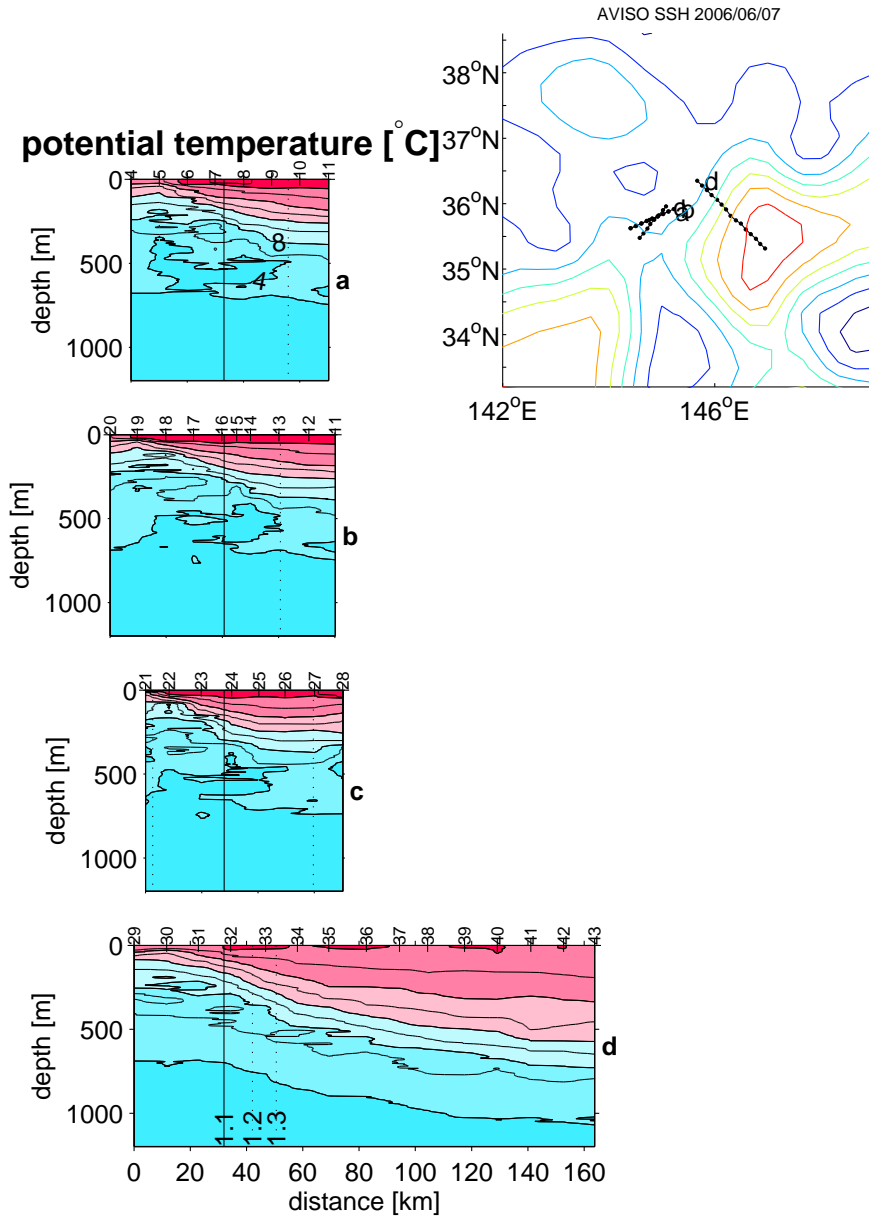


Figure 6: Feature Survey 1 Potential temperature contoured against depth and latitude (left panel) for the five survey sections (a) through (d) shown in the map (right panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height values at 100 m referenced to 1000 m in dynamic meters.

3.3.2 Salinity

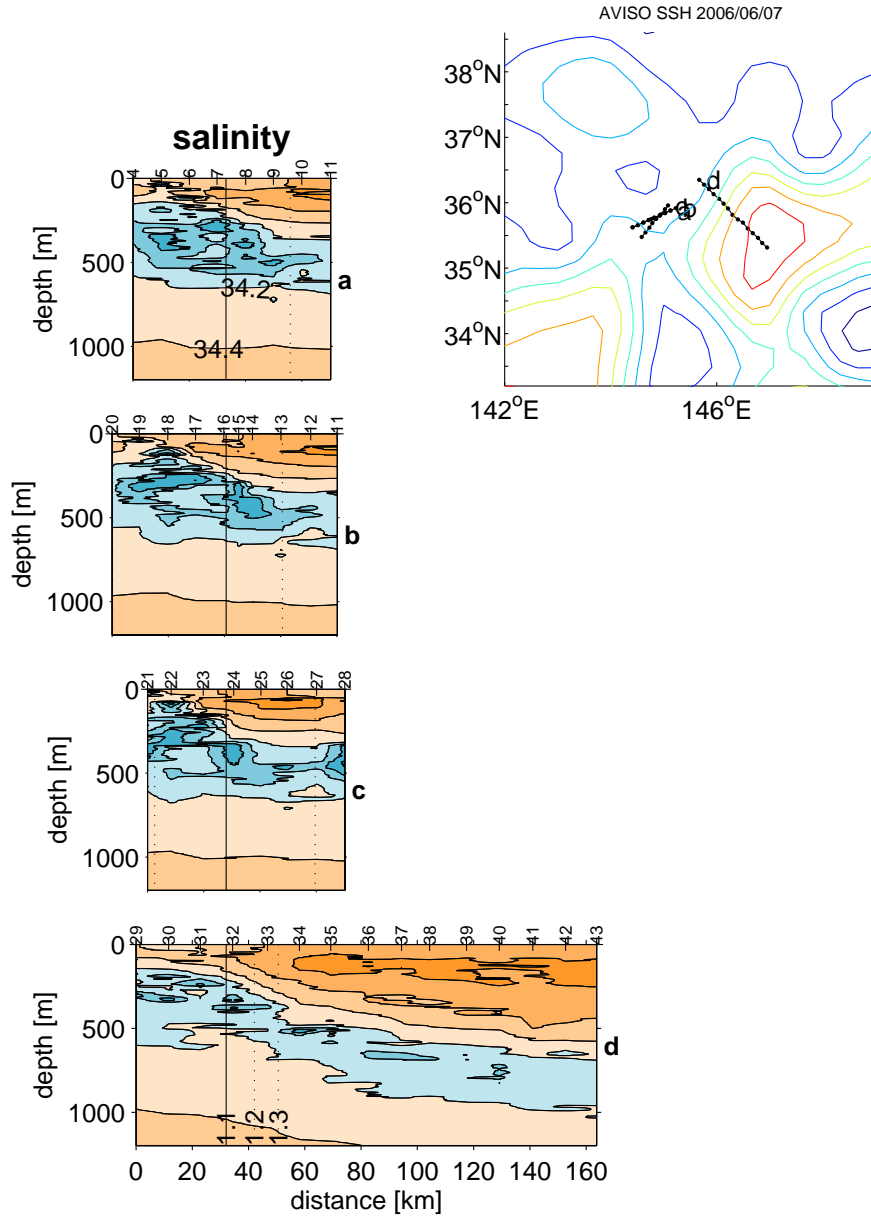


Figure 7: Feature Survey 1 Salinity contoured against depth and latitude (left panel) for the five survey sections (a) through (d) shown in the map (right panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height at 100m referenced to 1000m in dynamic meters.

3.3.3 Zonal Velocity

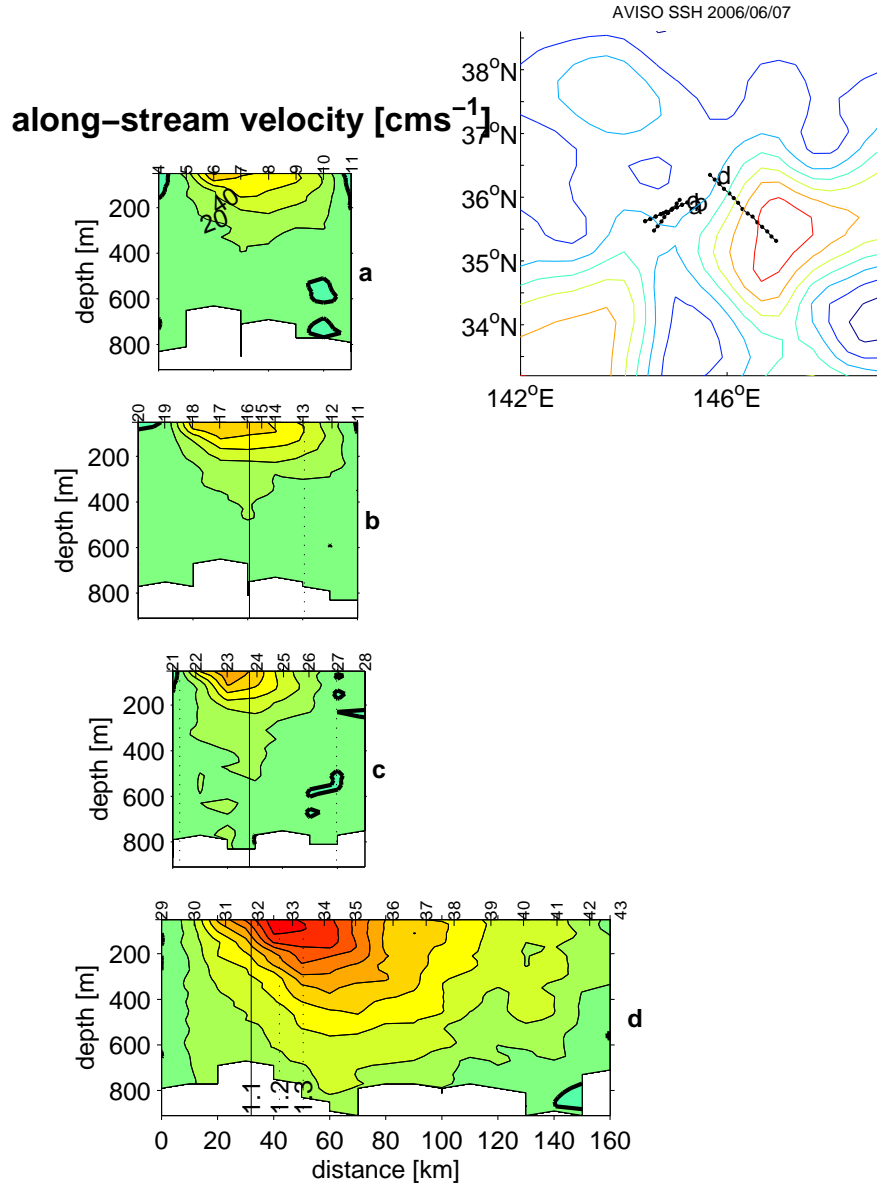


Figure 8: Feature Survey 1 zonal velocity (cm s^{-1}) contoured against depth and latitude (left panel) for the four survey sections (a) through (d) shown in the map (right Panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height values at 100m referenced to 1000m in dynamic meters. Note that $\text{CI} = 20 \text{ cm s}^{-1}$.

3.3.4 Meridional Velocity

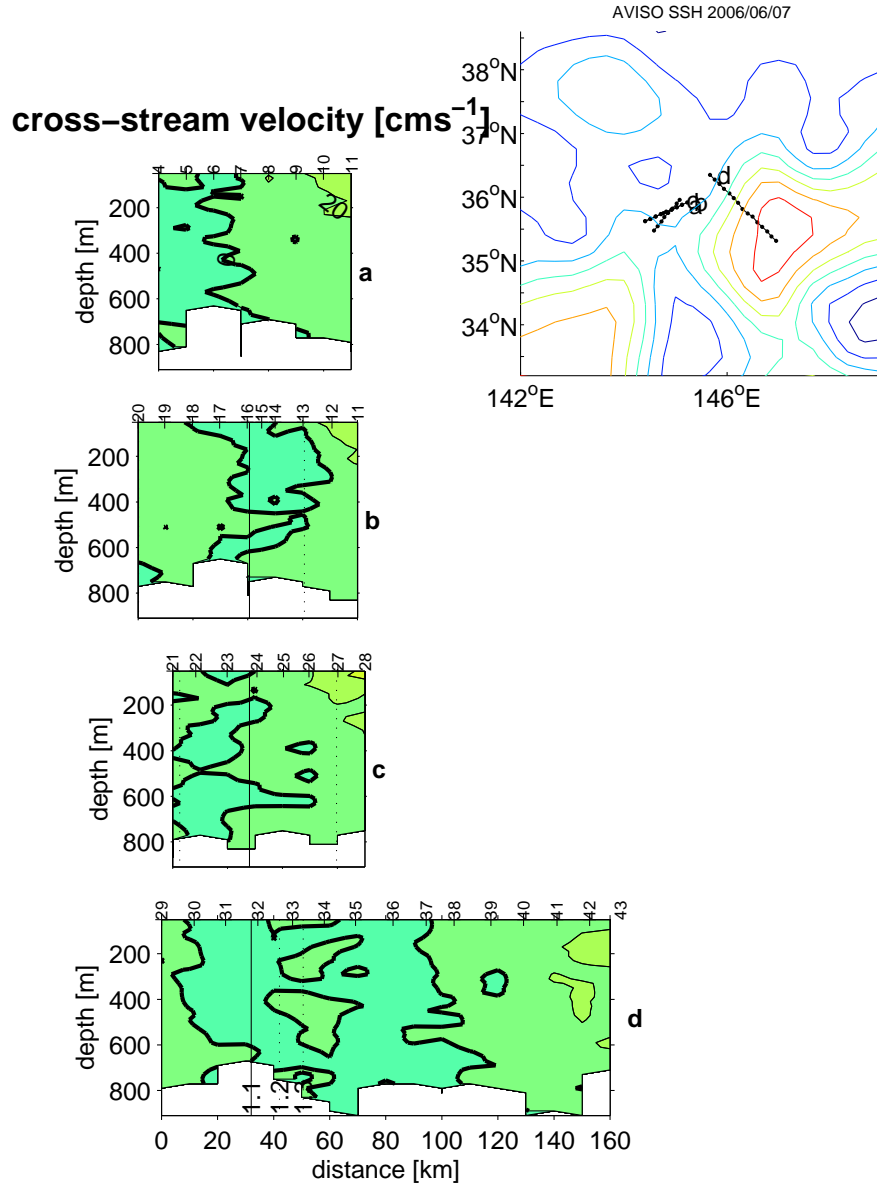


Figure 9: Feature Survey 1 meridional velocity (cm s^{-1}) contoured against depth and latitude (left panel) for the four survey sections (a) through (d) shown in the map (right Panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height values at 100m referenced to 1000m in dynamic meters. Note that $\text{CI} = 20 \text{ cm s}^{-1}$.

3.4 Feature Survey 2

3.4.1 Potential Temperature

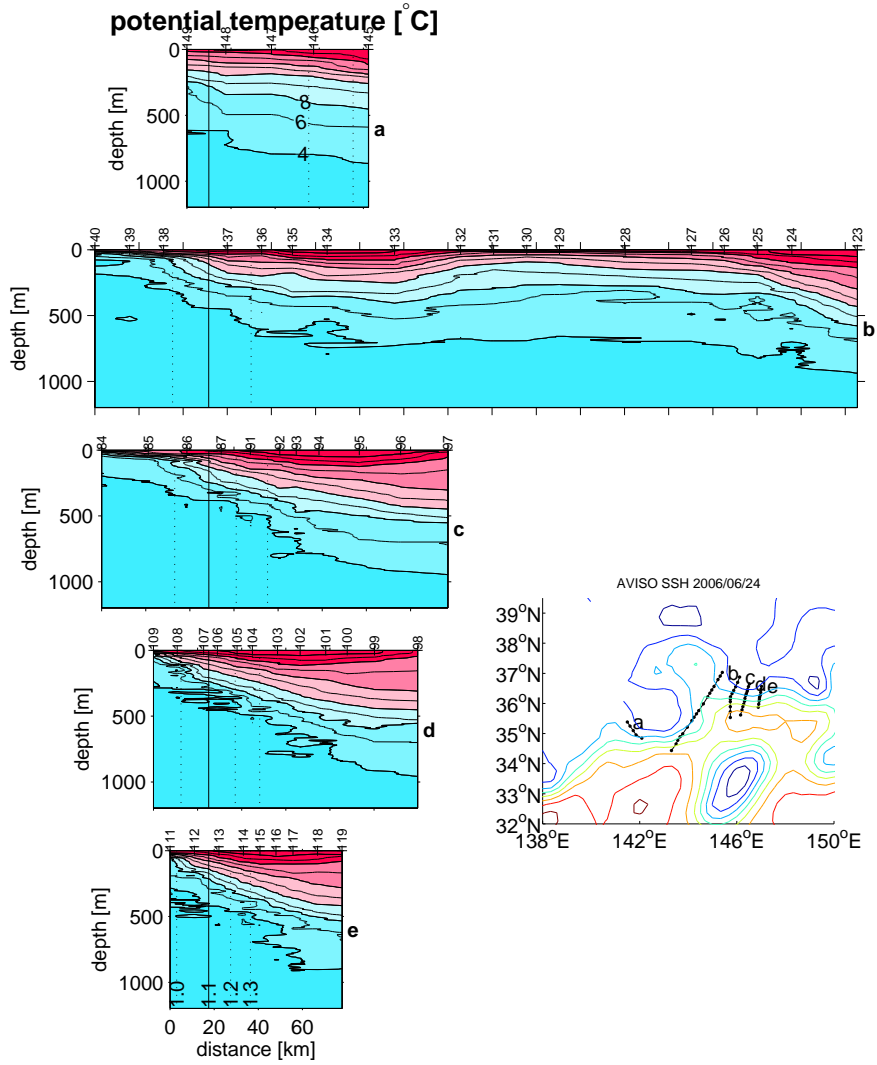


Figure 10: Feature Survey 2 Potential temperature contoured against depth and latitude (left panel) for the five survey sections (a) through (d) shown in the map (right panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height values at 100 m referenced to 1000 m in dynamic meters.

3.4.2 Salinity

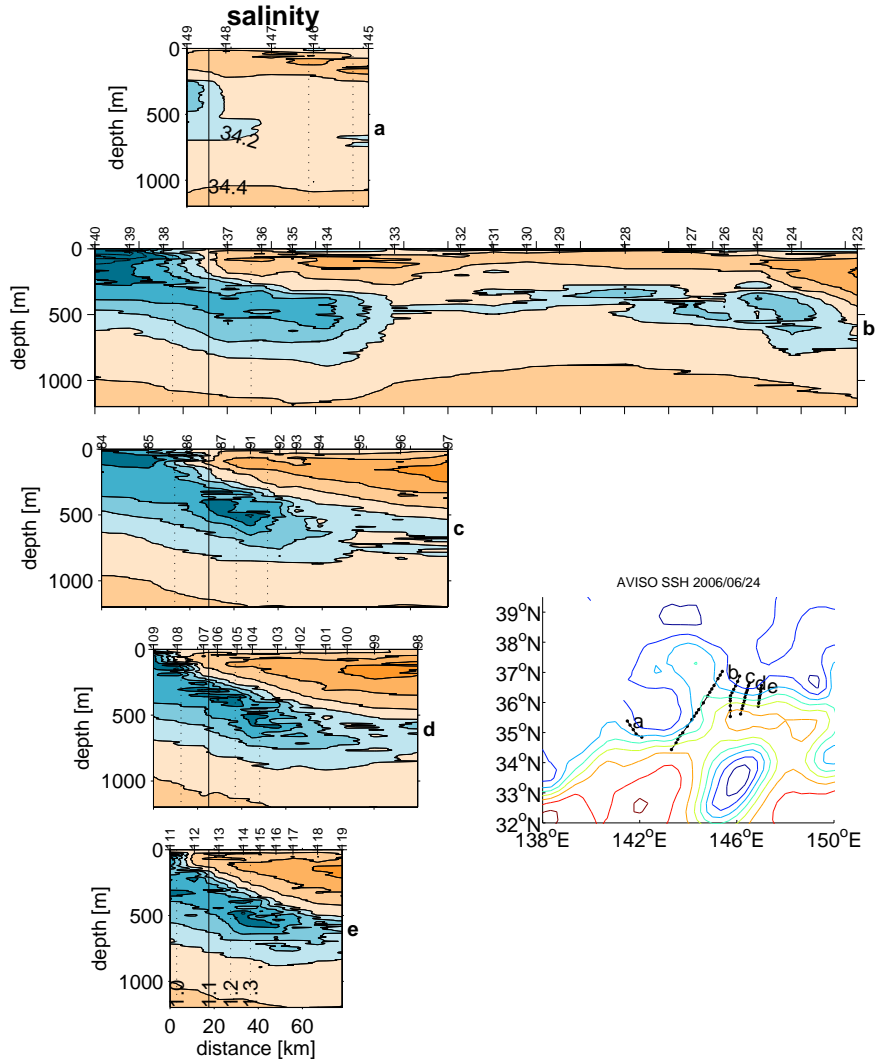
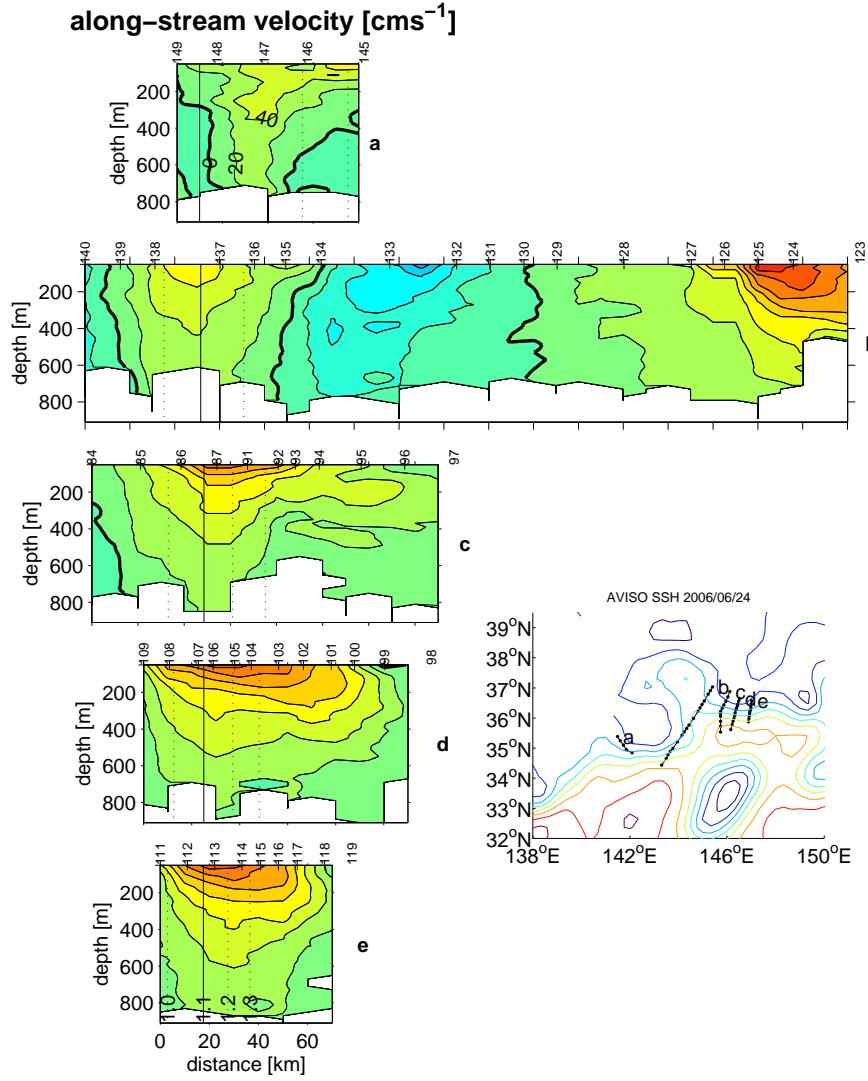


Figure 11: Feature Survey 2 Salinity contoured against depth and latitude (left panel) for the five survey sections (a) through (d) shown in the map (right panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height at 100m referenced to 1000m in dynamic meters.

3.4.3 Zonal Velocity



3.4.4 Meridional Velocity

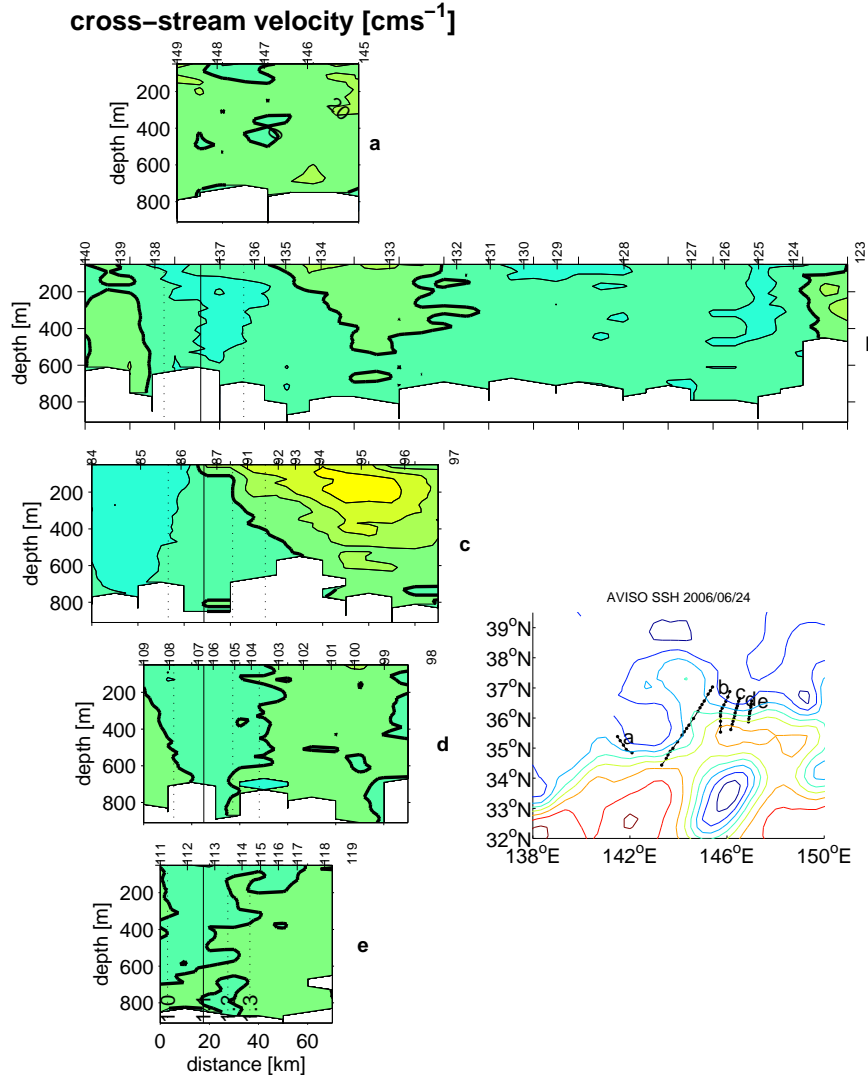
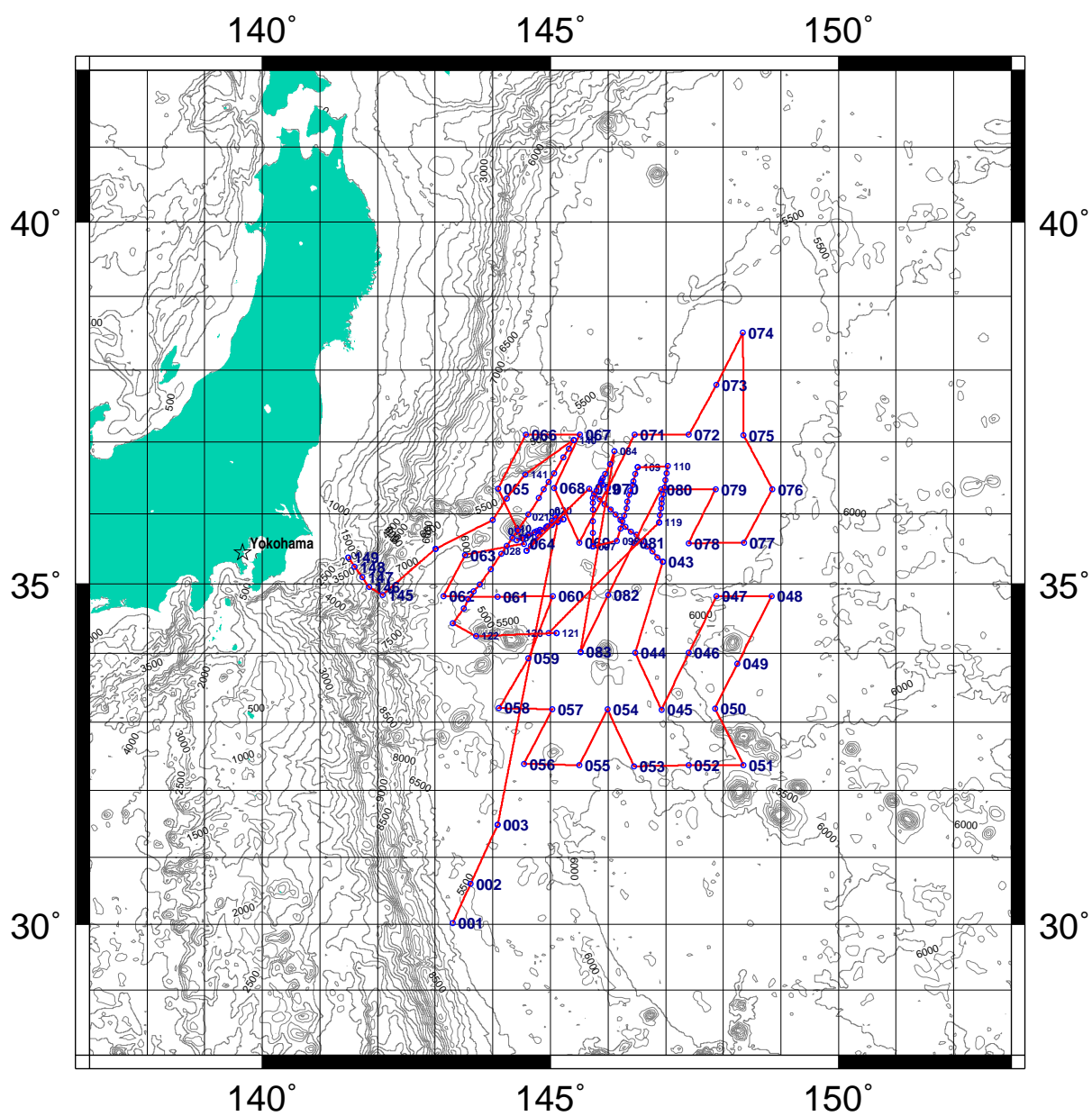


Figure 13: Feature Survey 2 meridional velocity (cm s^{-1}) contoured against depth and latitude (left panel) for the four survey sections (a) through (d) shown in the map (right Panel). Dashed and solid vertical lines superimposed on the contour plots are dynamic height values at 100m referenced to 1000m in dynamic meters. Note that $\text{CI} = 20 \text{ cm s}^{-1}$.

3.5 Ship Track



KESS-2006 Cruise Track 2006-07-04 08:13

Figure 14: R/V Melville: Watts/Donohue KESS cruise track for June 1–July 5, 2006

3.6 ADCP Data

3.6.1 diff os75 from nb150

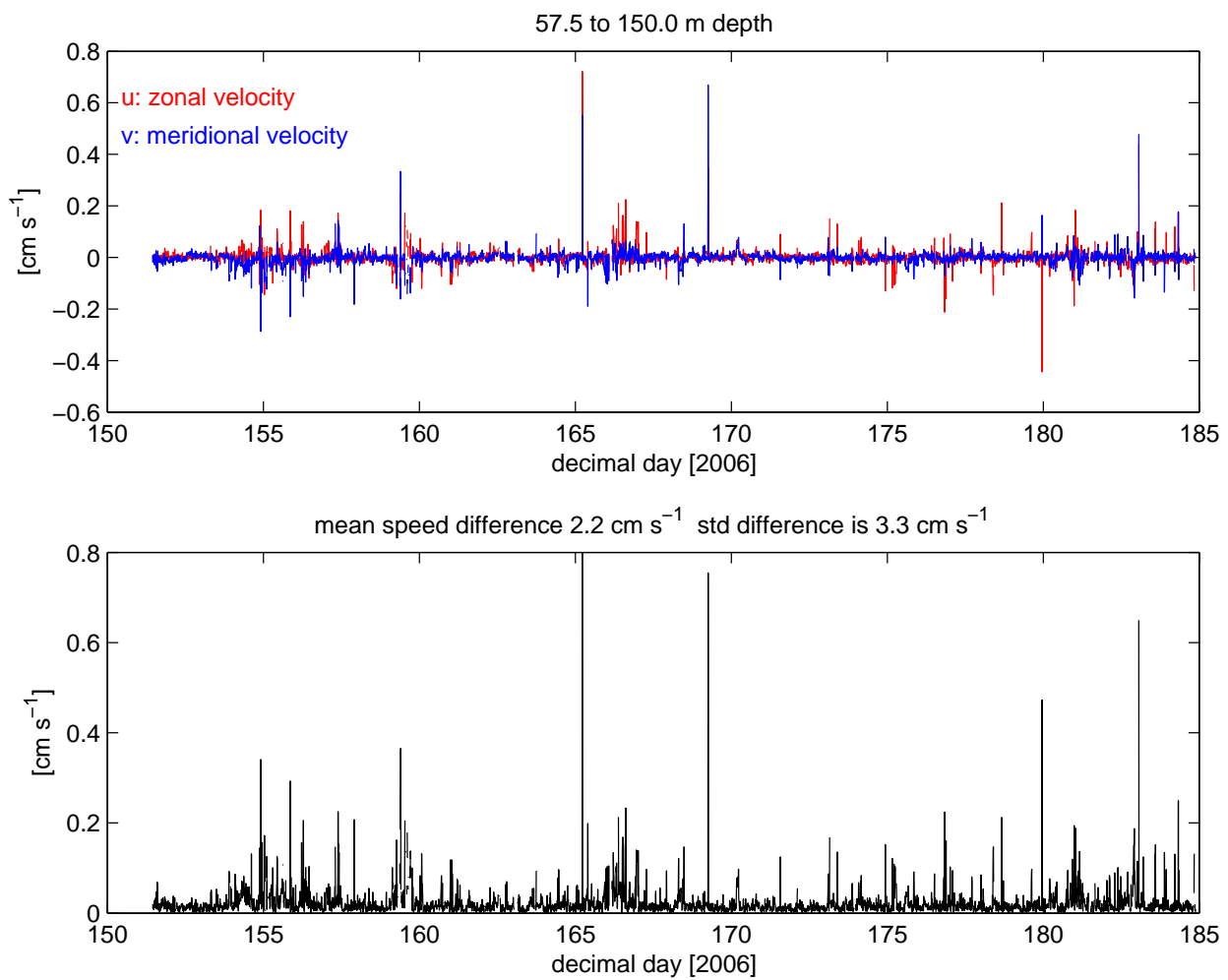


Figure 15: NB150 and OS75 velocities Comparison

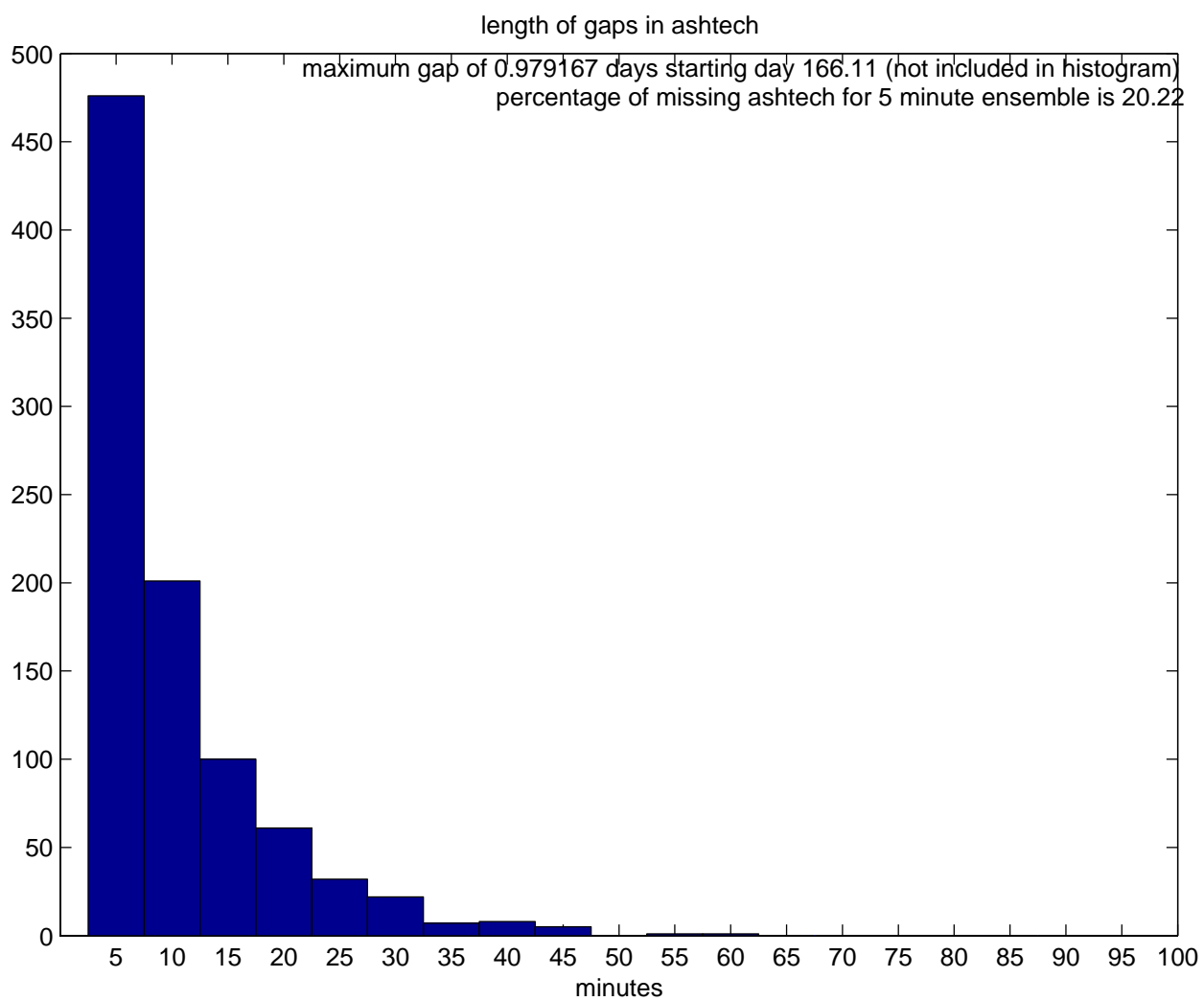


Figure 16: Histogram of length of gaps in acquisition of Ashtech data.

3.6.2 Along-Track Vector

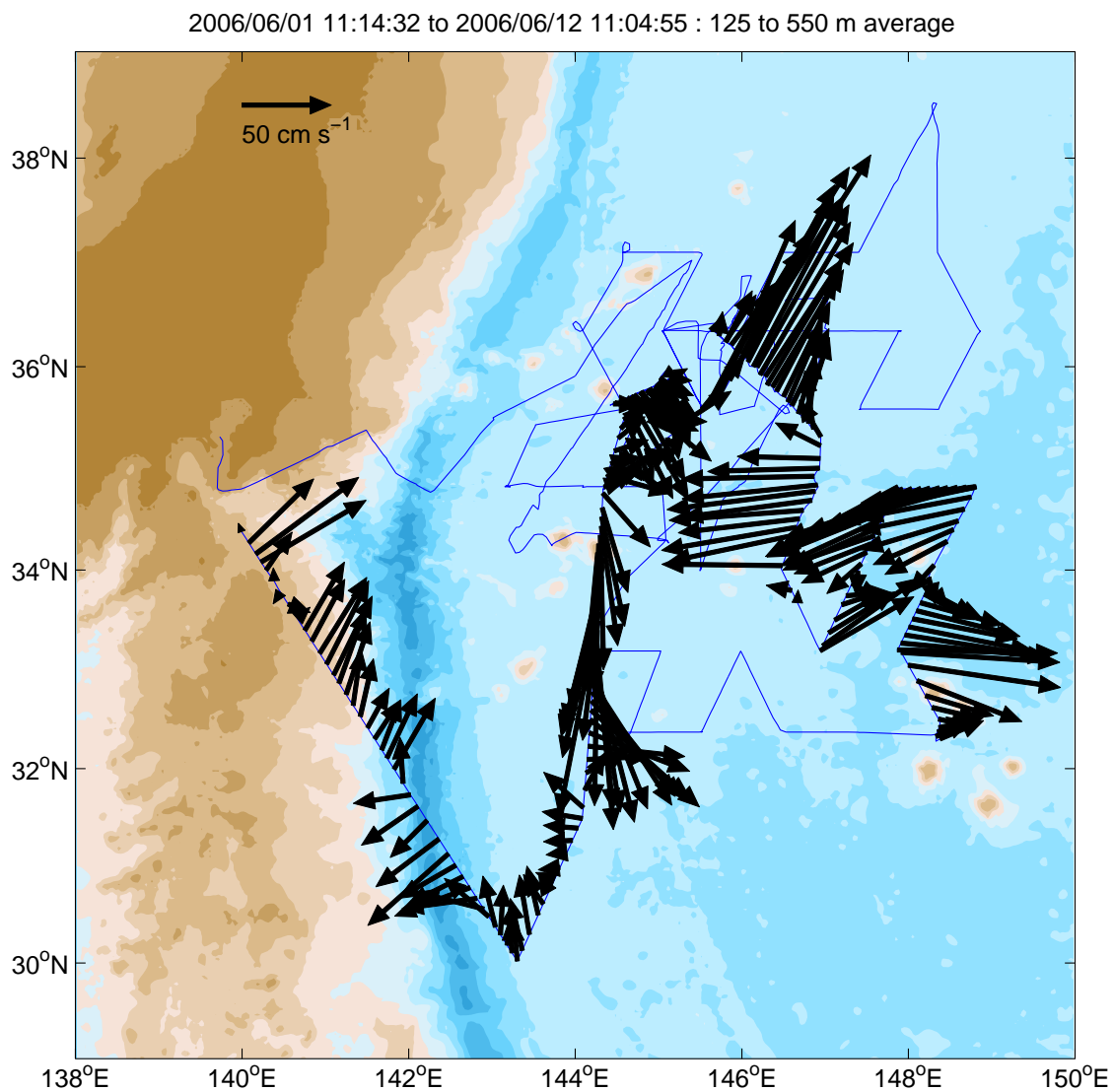


Figure 17: Average velocity vectors from the ADCP superimposed on Smith & Sandwell bathymetry contoured every 1000m.

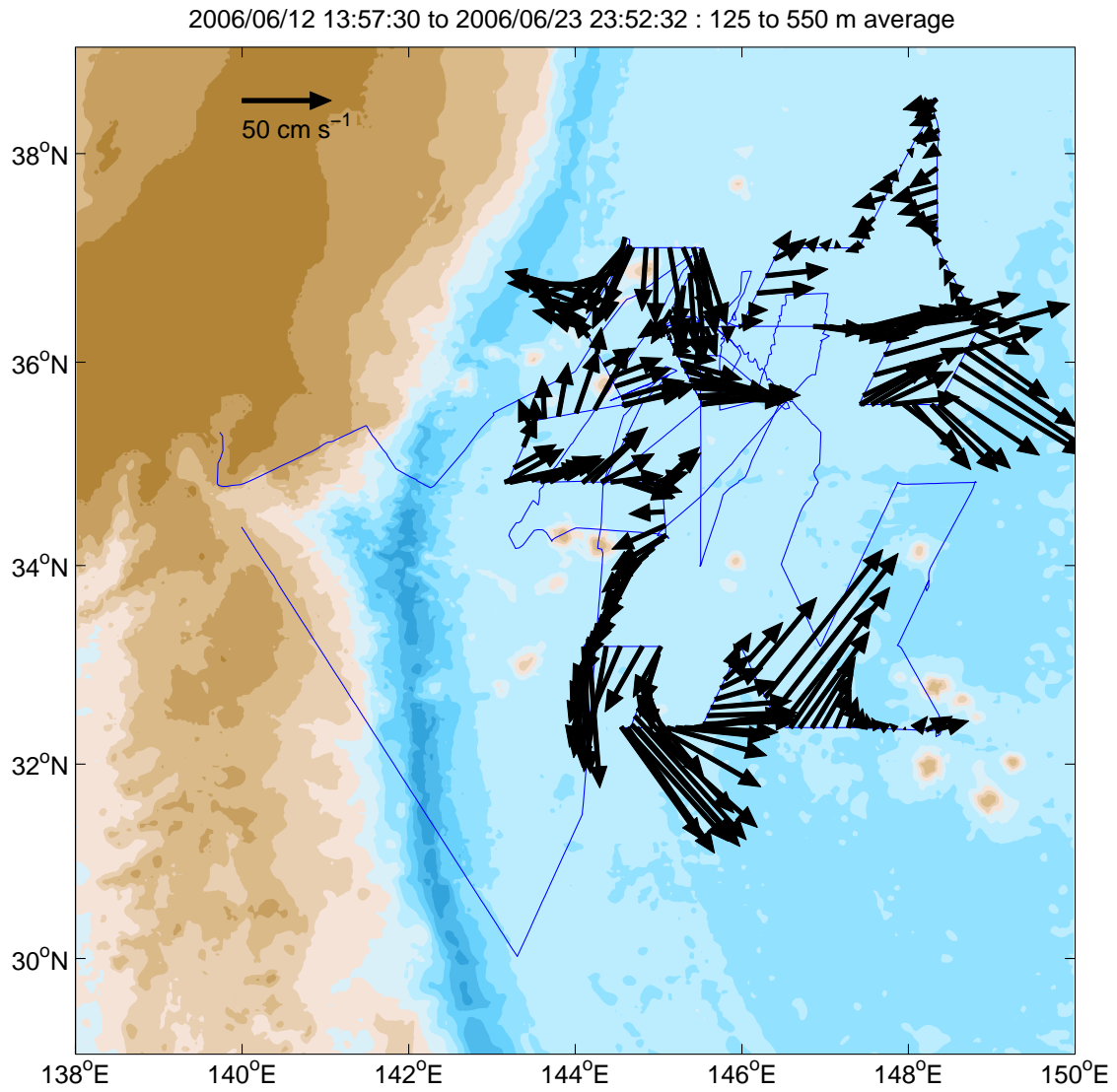


Figure 18: Average velocity vectors from the ADCP superimposed on Smith & Sandwell bathymetry contoured every 1000m.

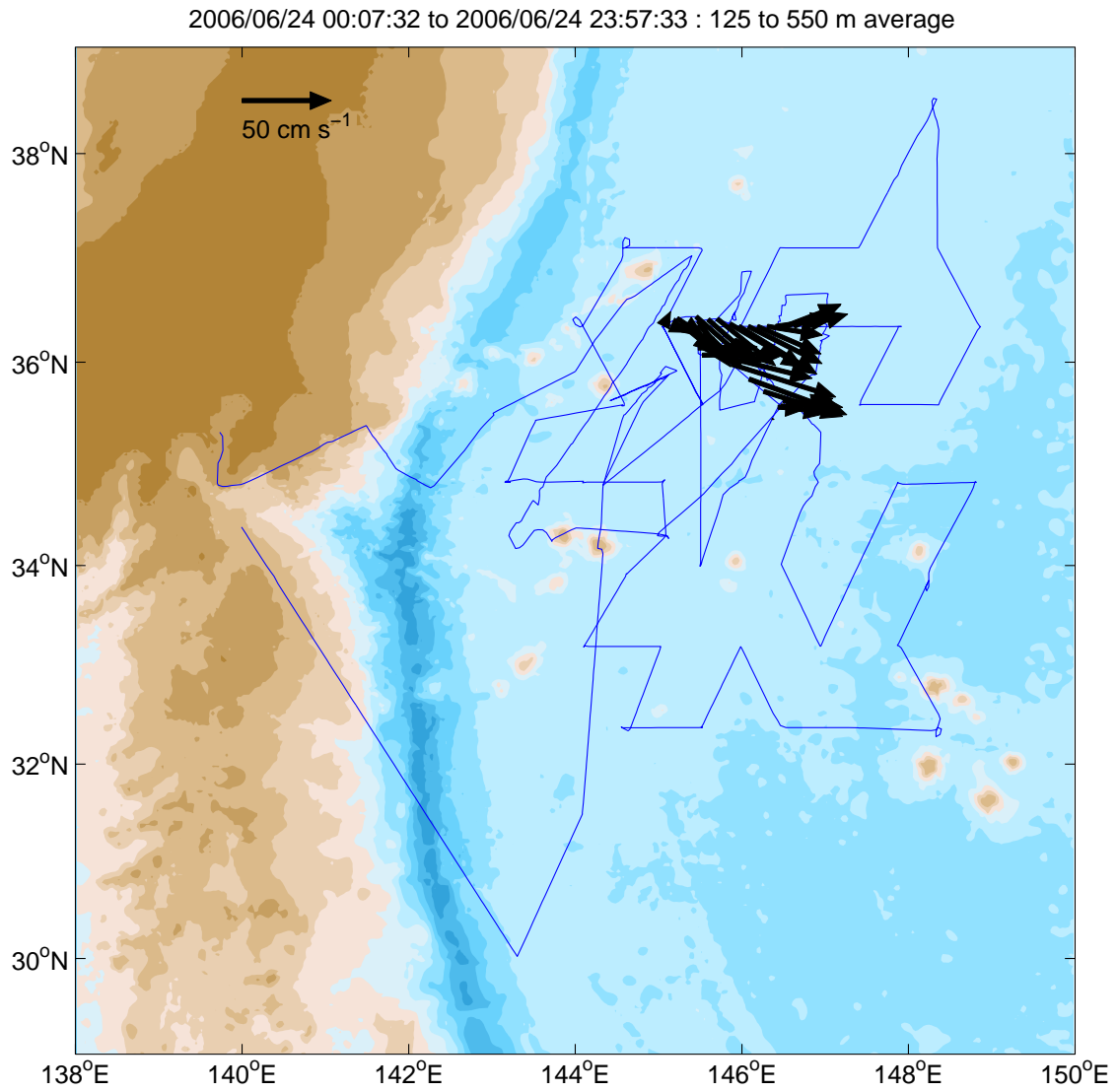


Figure 19: Average velocity vectors from the ADCP superimposed on Smith & Sandwell bathymetry contoured every 1000m.

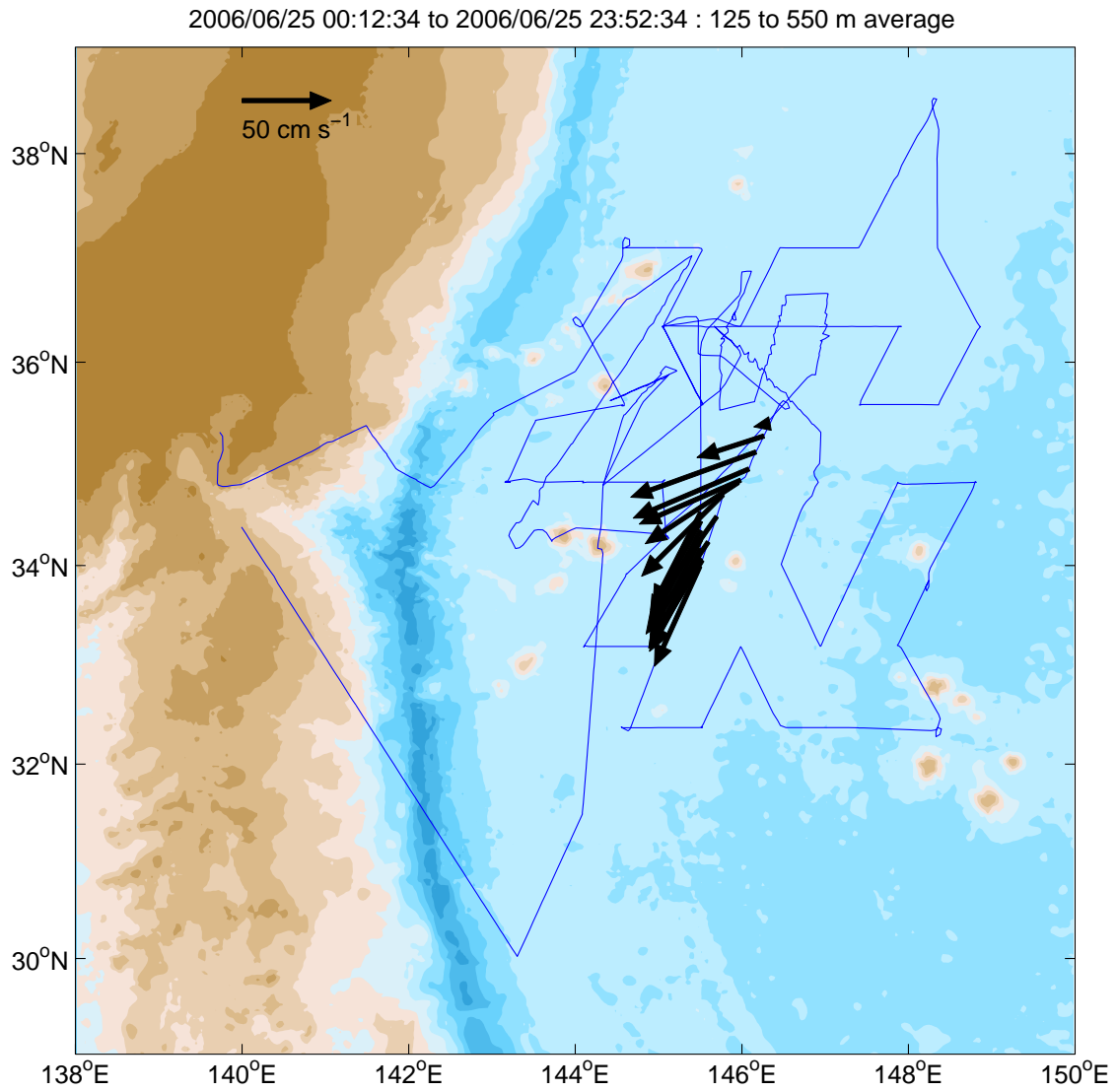


Figure 20: Average velocity vectors from the ADCP superimposed on Smith & Sandwell bathymetry contoured every 1000m.

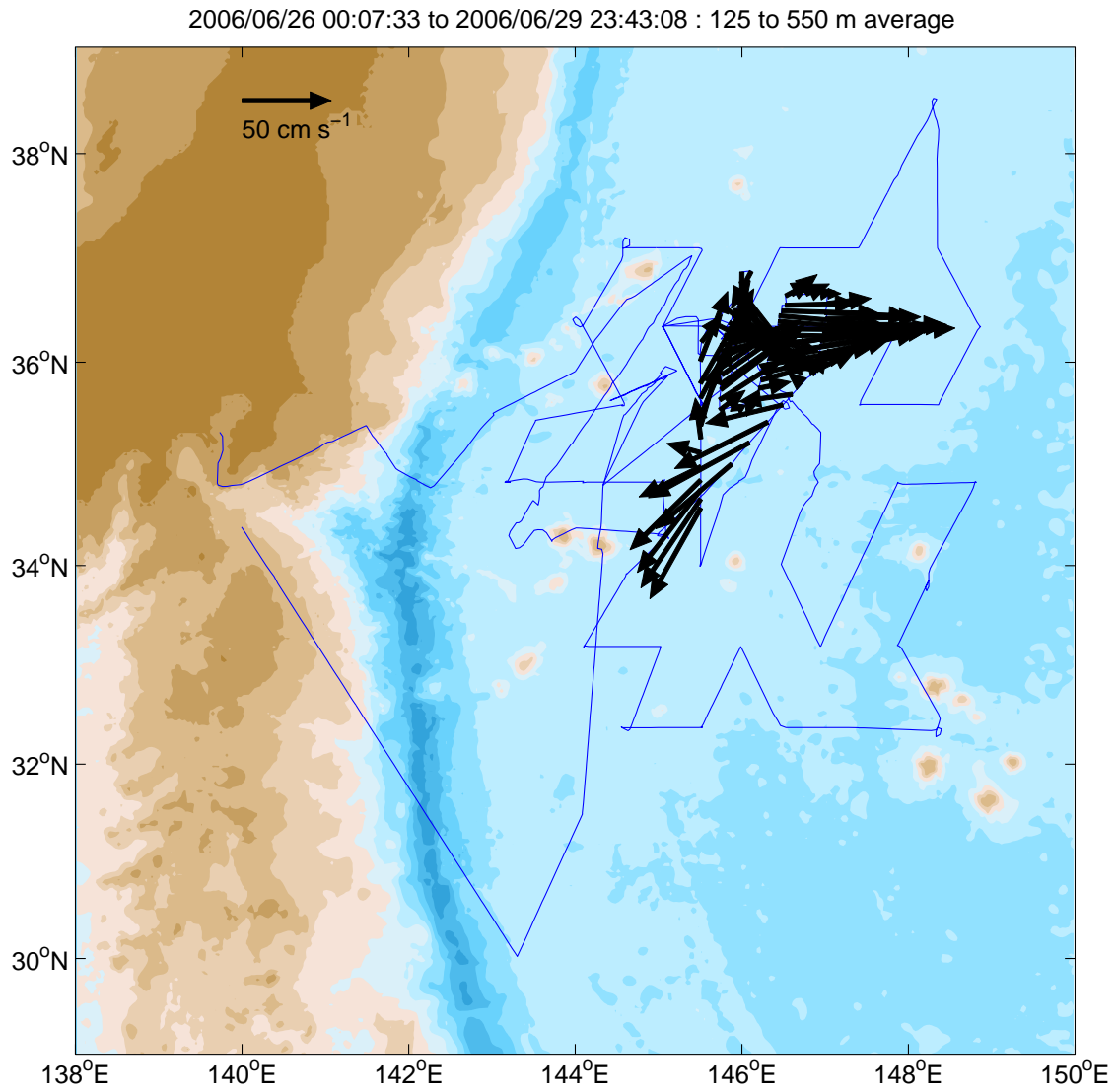


Figure 21: Average velocity vectors from the ADCP superimposed on Smith & Sandwell bathymetry contoured every 1000m.

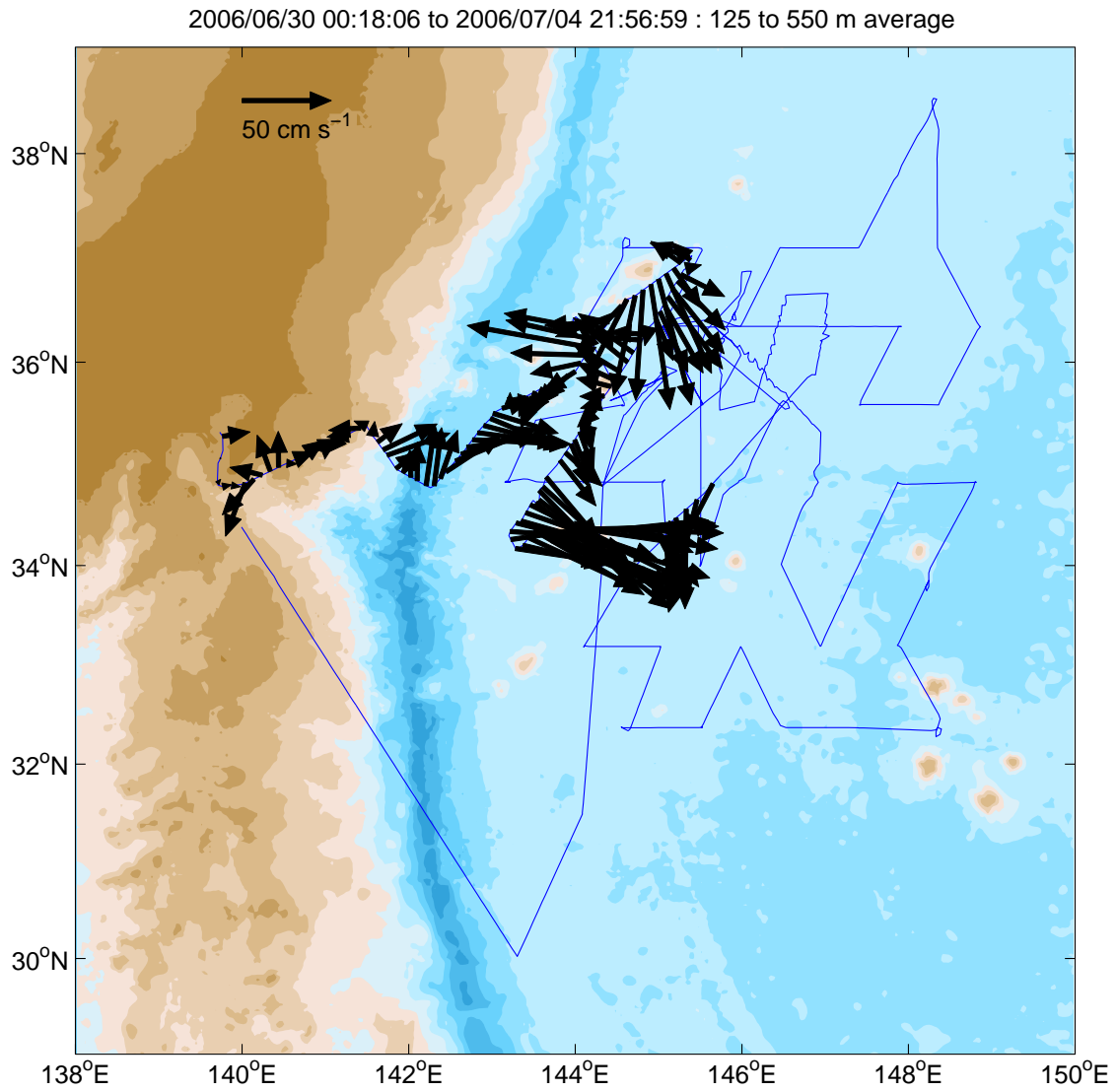
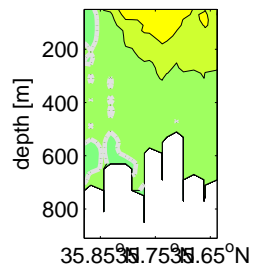


Figure 22: Average velocity vectors from the ADCP superimposed on Smith & Sandwell bathymetry contoured every 1000m.

3.6.3 Cross Sections of Kuroshio

zonal velocity : 2006/06/04 17:34:52 to 2006/06/05 06:52:23



meridional velocity : 2006/06/04 17:34:52 to 2006/06/05 06:52:23

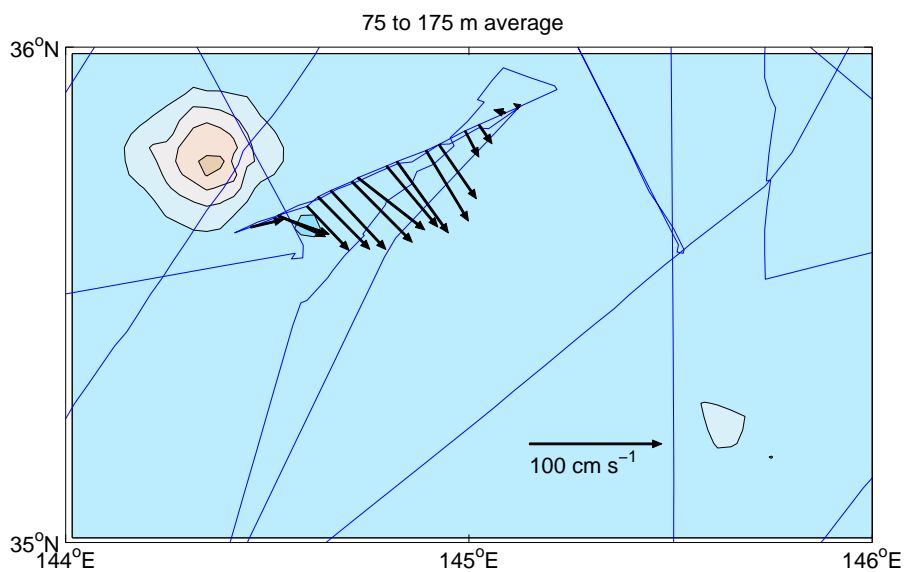
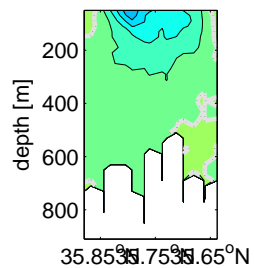
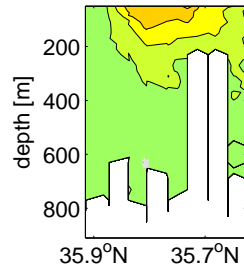


Figure 23: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

zonal velocity : 2006/06/05 07:44:53 to 2006/06/05 23:47:22



meridional velocity : 2006/06/05 07:44:53 to 2006/06/05 23:47:22

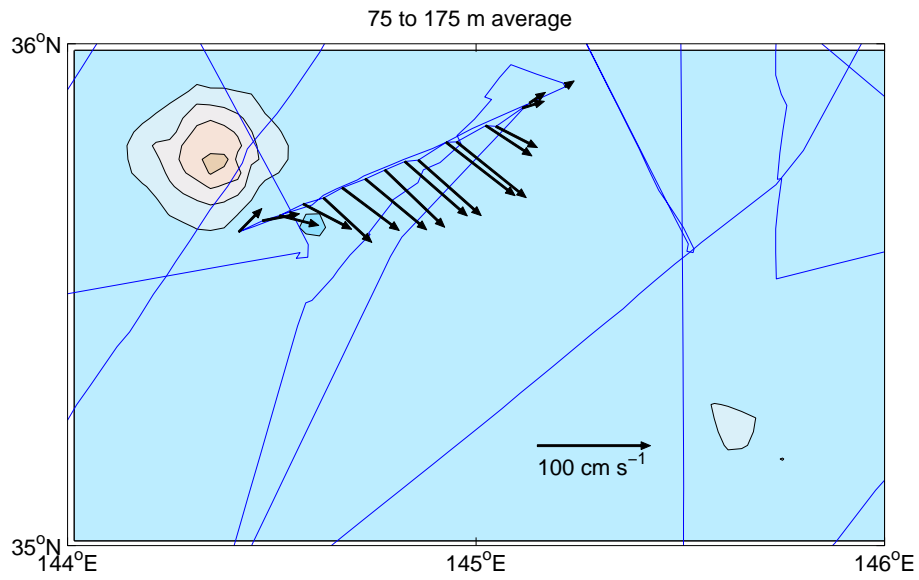
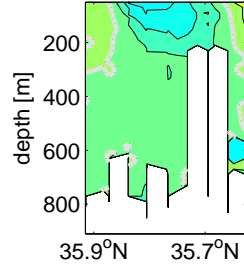
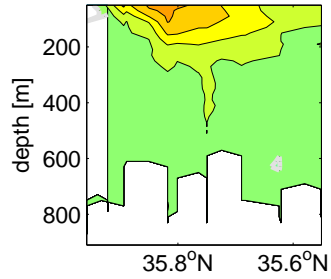


Figure 24: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

zonal velocity : 2006/06/06 00:42:22 to 2006/06/06 14:22:22



meridional velocity : 2006/06/06 00:42:22 to 2006/06/06 14:22:22

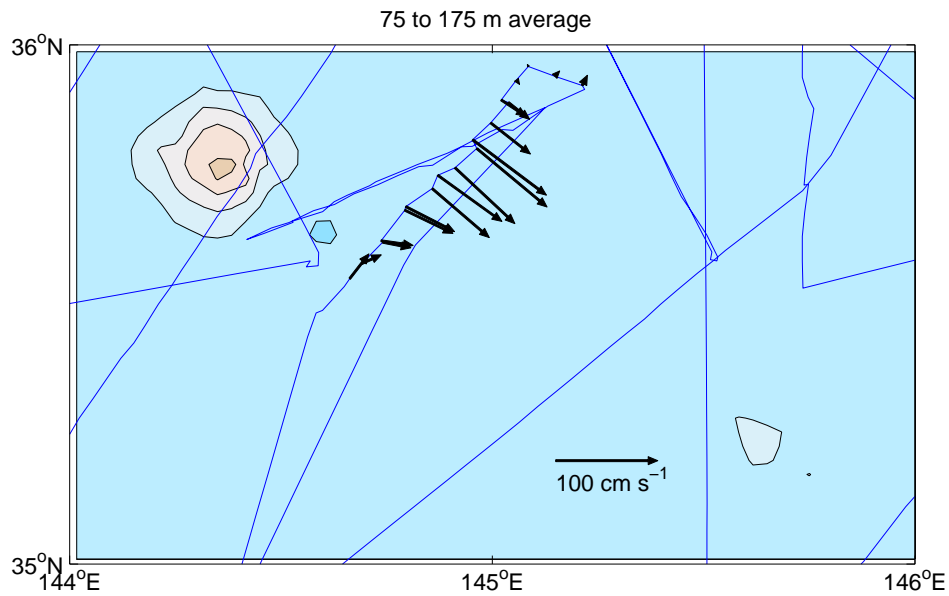
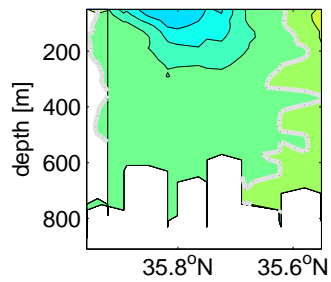


Figure 25: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

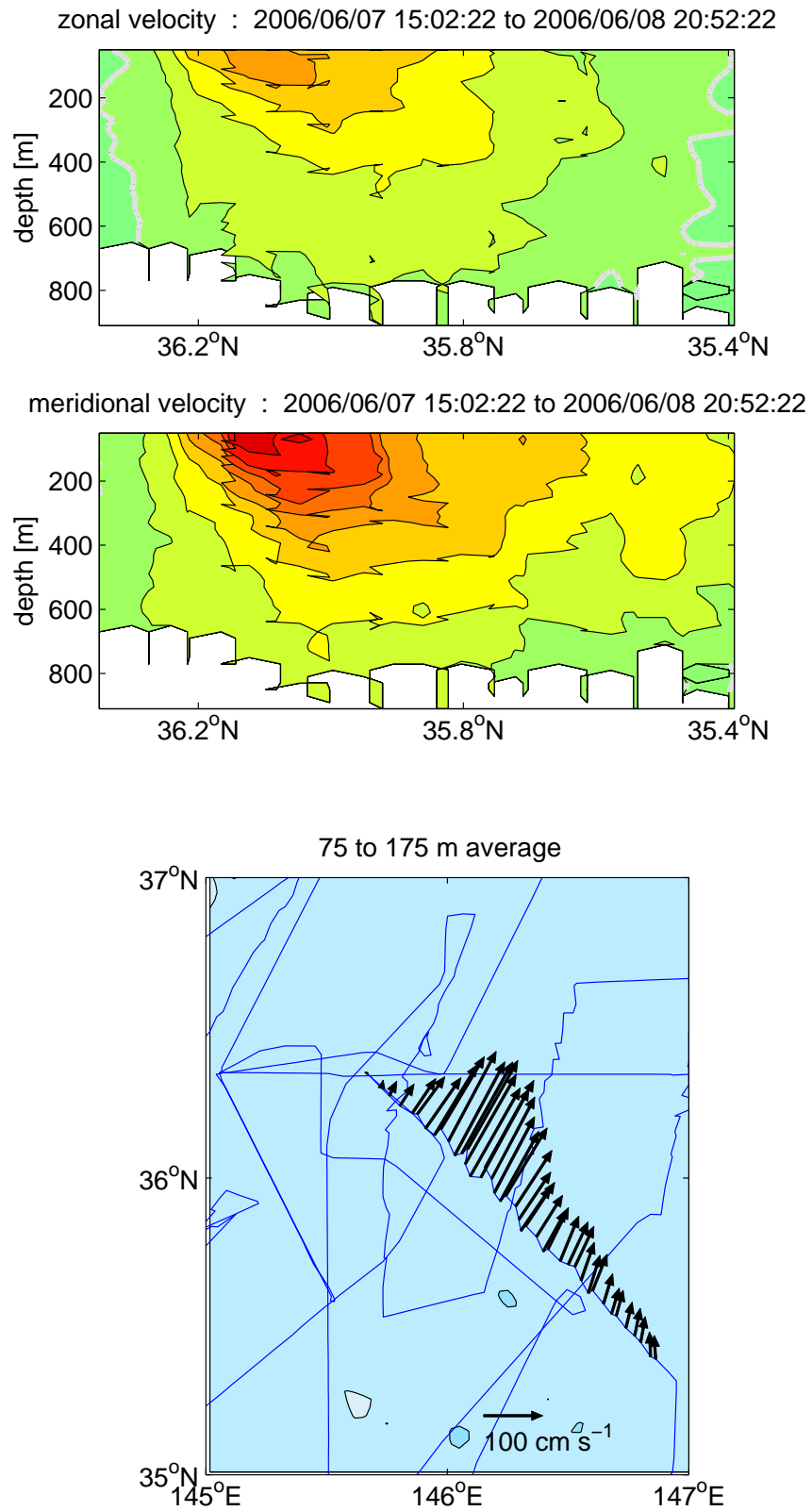


Figure 26: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

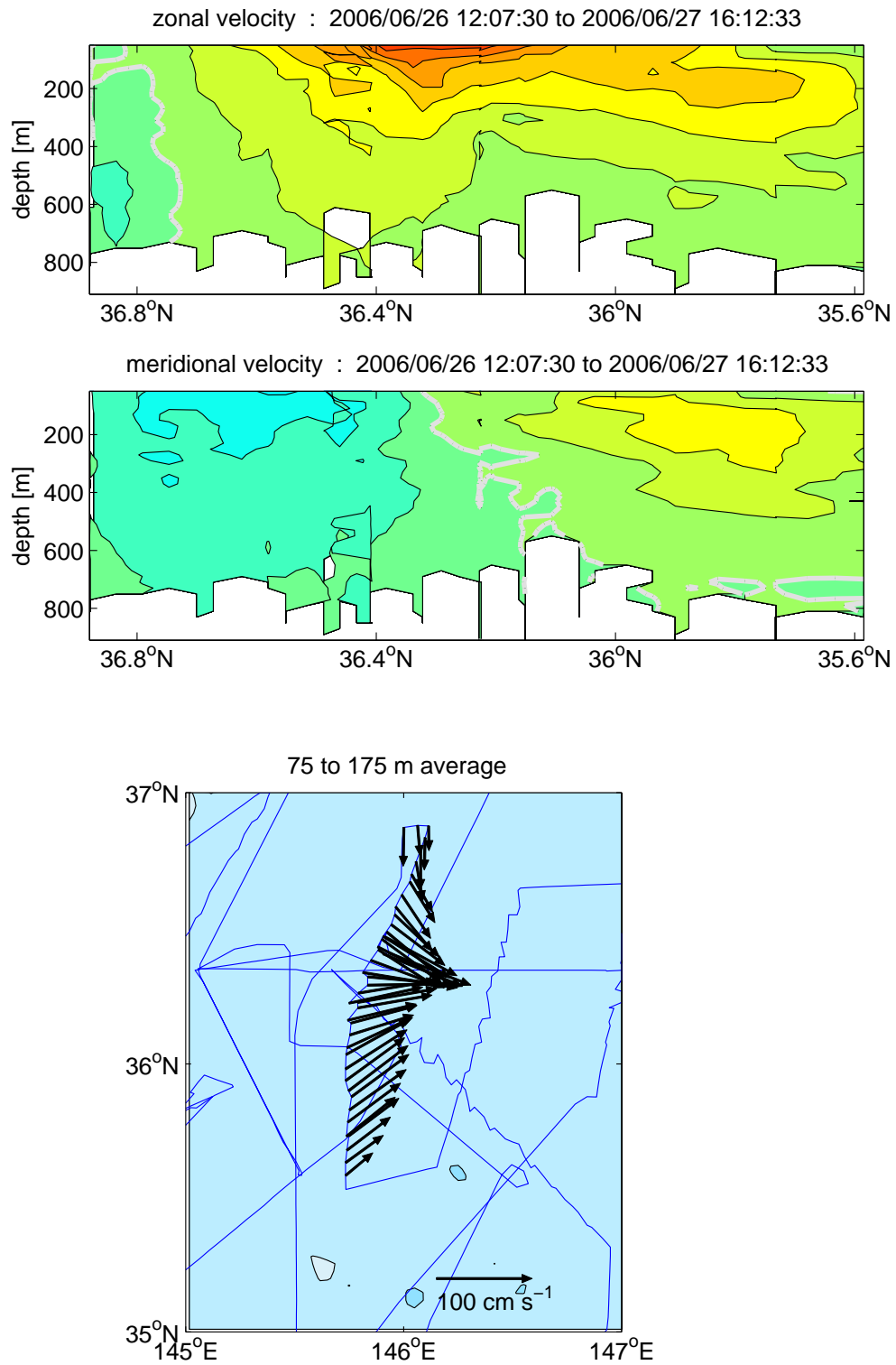


Figure 27: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

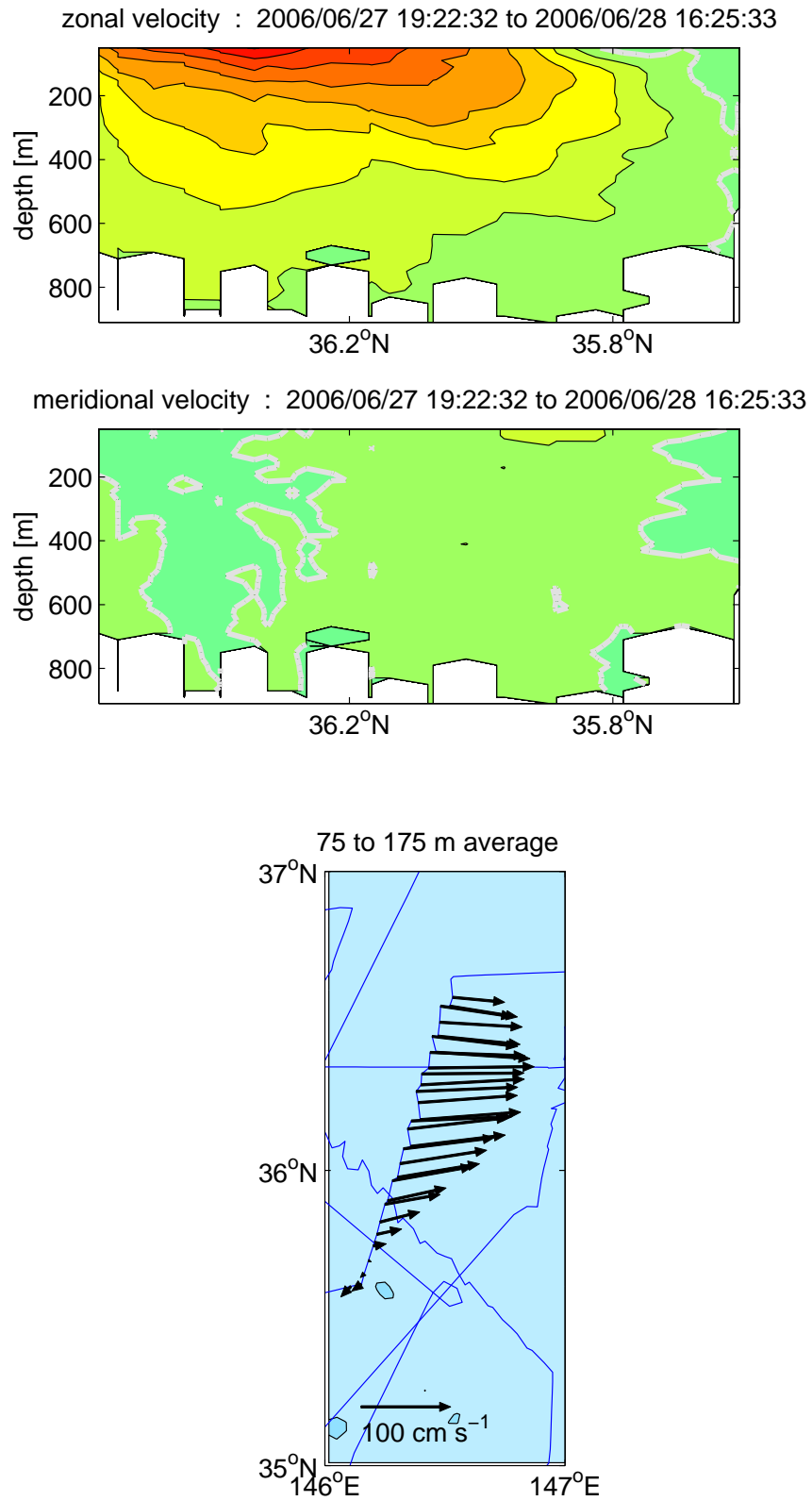
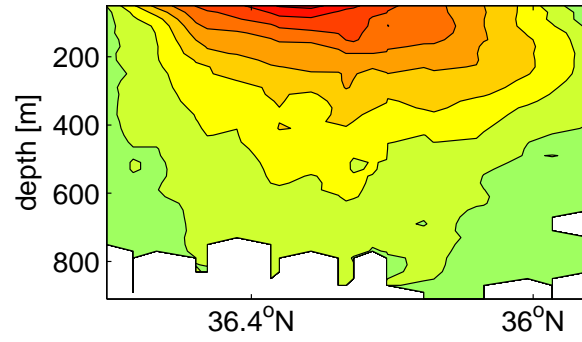


Figure 28: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

zonal velocity : 2006/06/28 21:53:05 to 2006/06/29 16:03:07



meridional velocity : 2006/06/28 21:53:05 to 2006/06/29 16:03:07

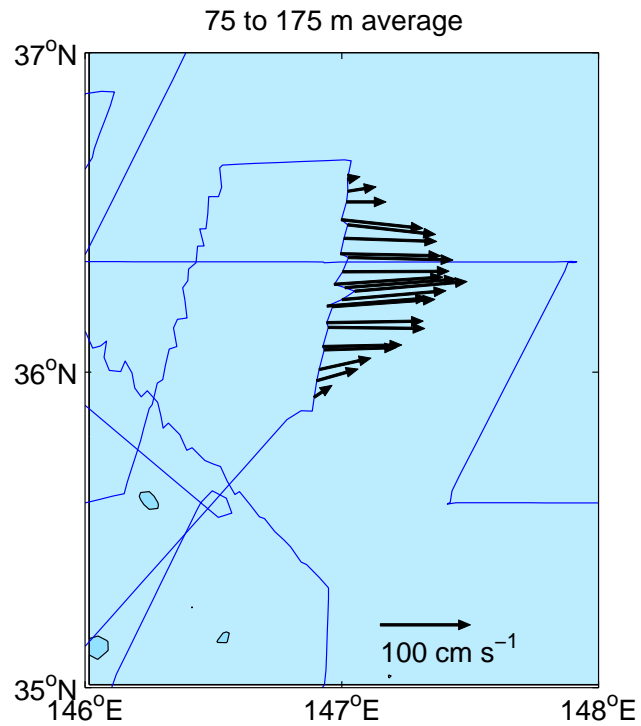
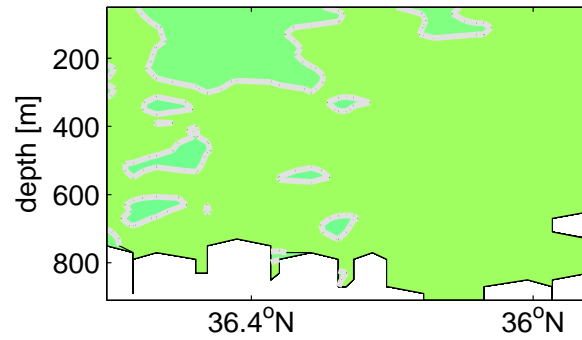


Figure 29: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

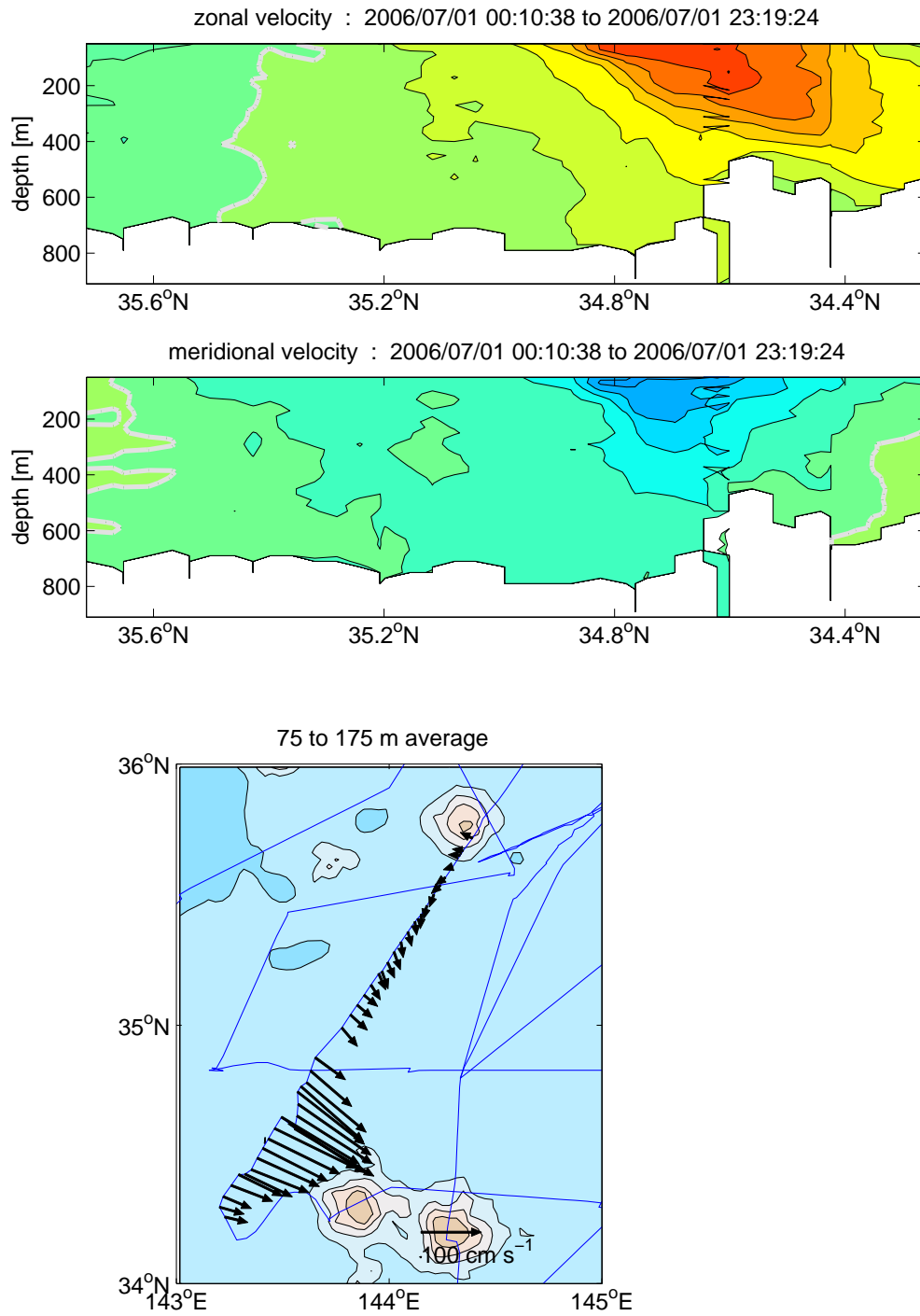


Figure 30: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

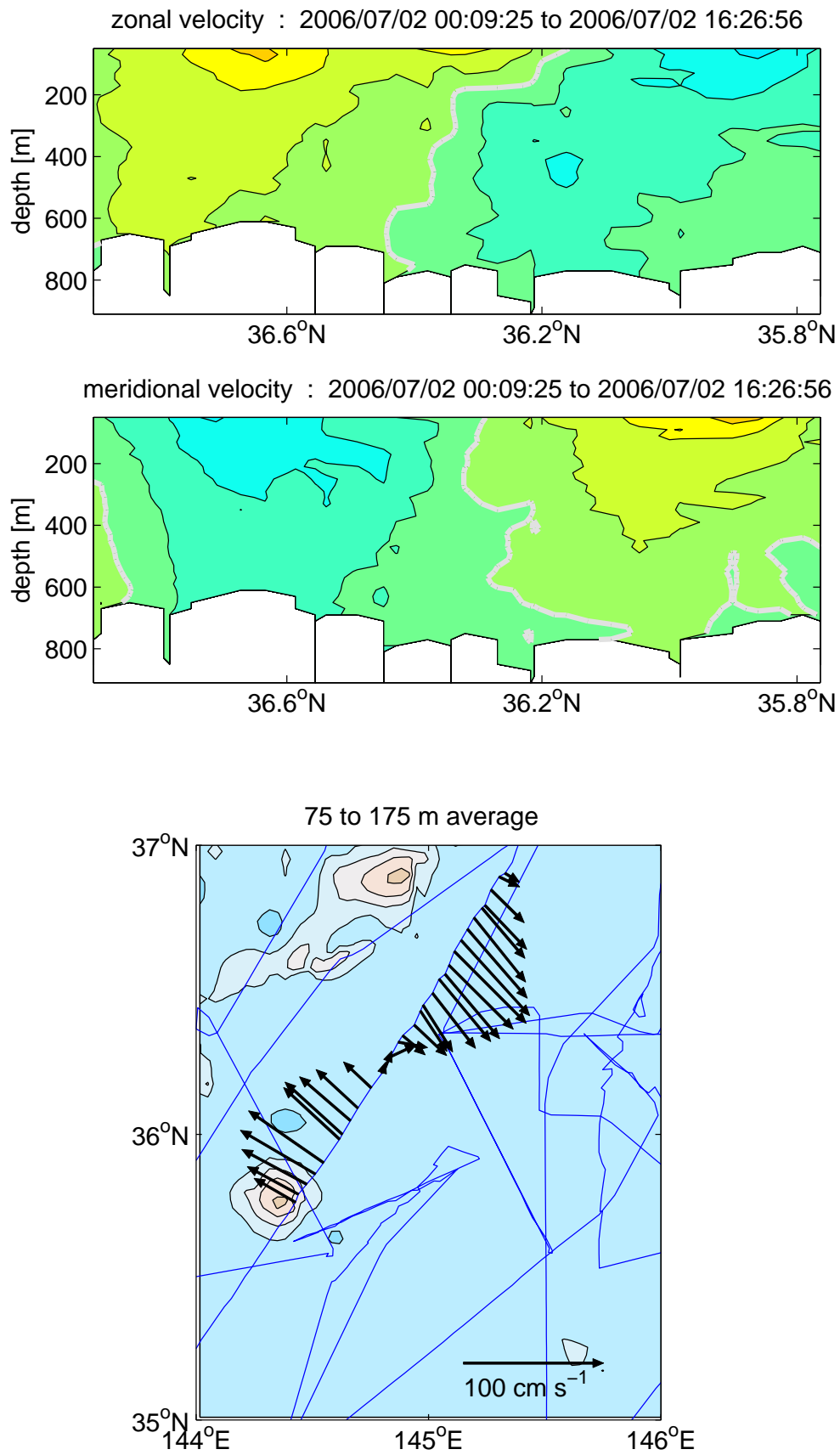


Figure 31: Upper panels: zonal (top) and meridional (middle) velocity from the ADCP. Lower panel: ADCP average velocity vectors superimposed on Smith & Sandwell bathymetry contoured every 1000 m.

3.6.4 12Z

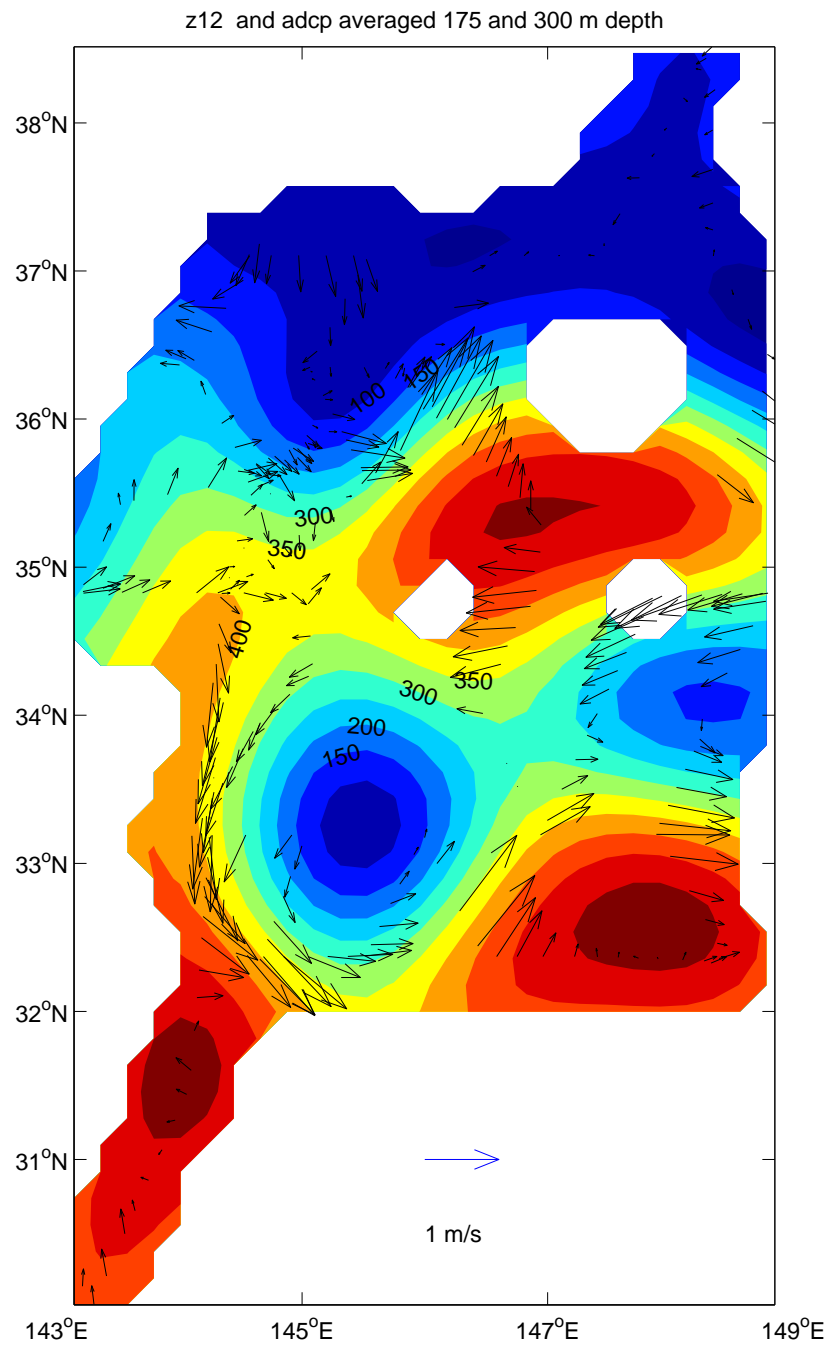


Figure 32: 12Z Contour & ADCP Averaged 175 and 300m Depth

3.7 Time Series of MET Data

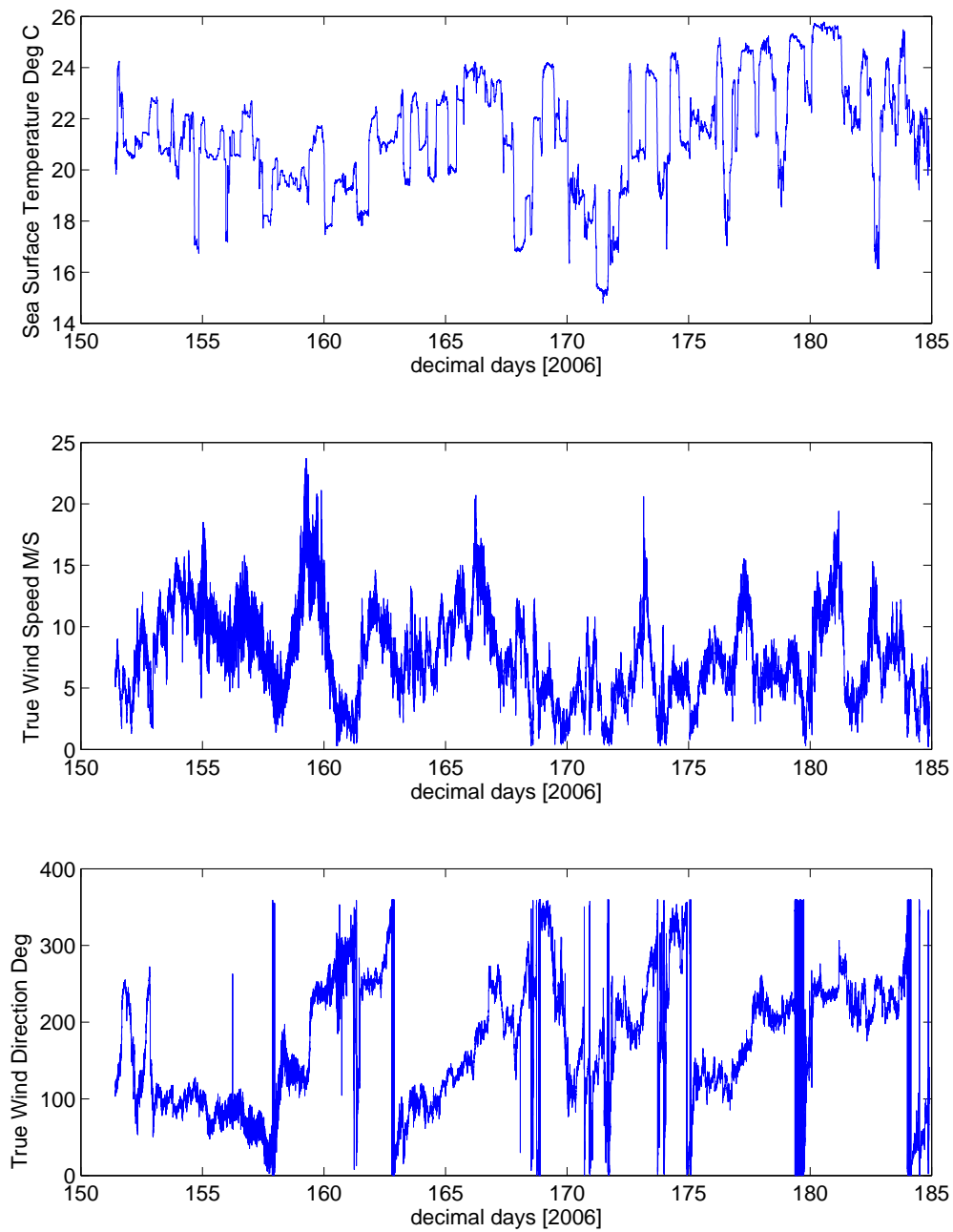


Figure 33: Subplot time series of SST in $^{\circ}\text{C}$ (top), True Wind Speed in m s^{-1} , and True Wind Direction in degrees (bottom) versus decimal day for year 2006.

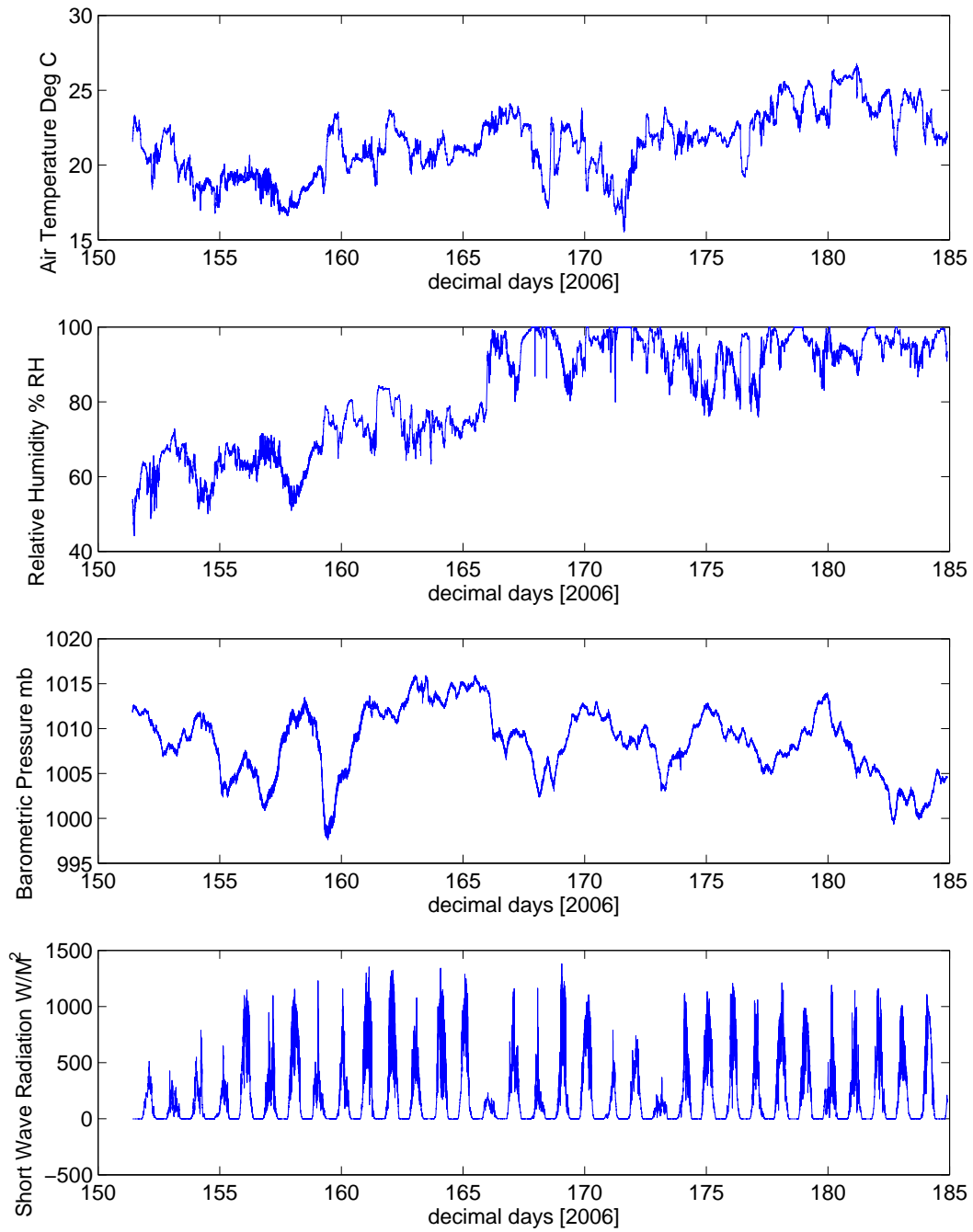


Figure 34: Subplot time series of Air Temperature in $^{\circ}\text{C}$ (top), Relative Humidity, Barometric Pressure in mbar, and Short Wave Radiation in W m^{-2} versus decimal day for year 2006.

3.8 NLOM Analysis

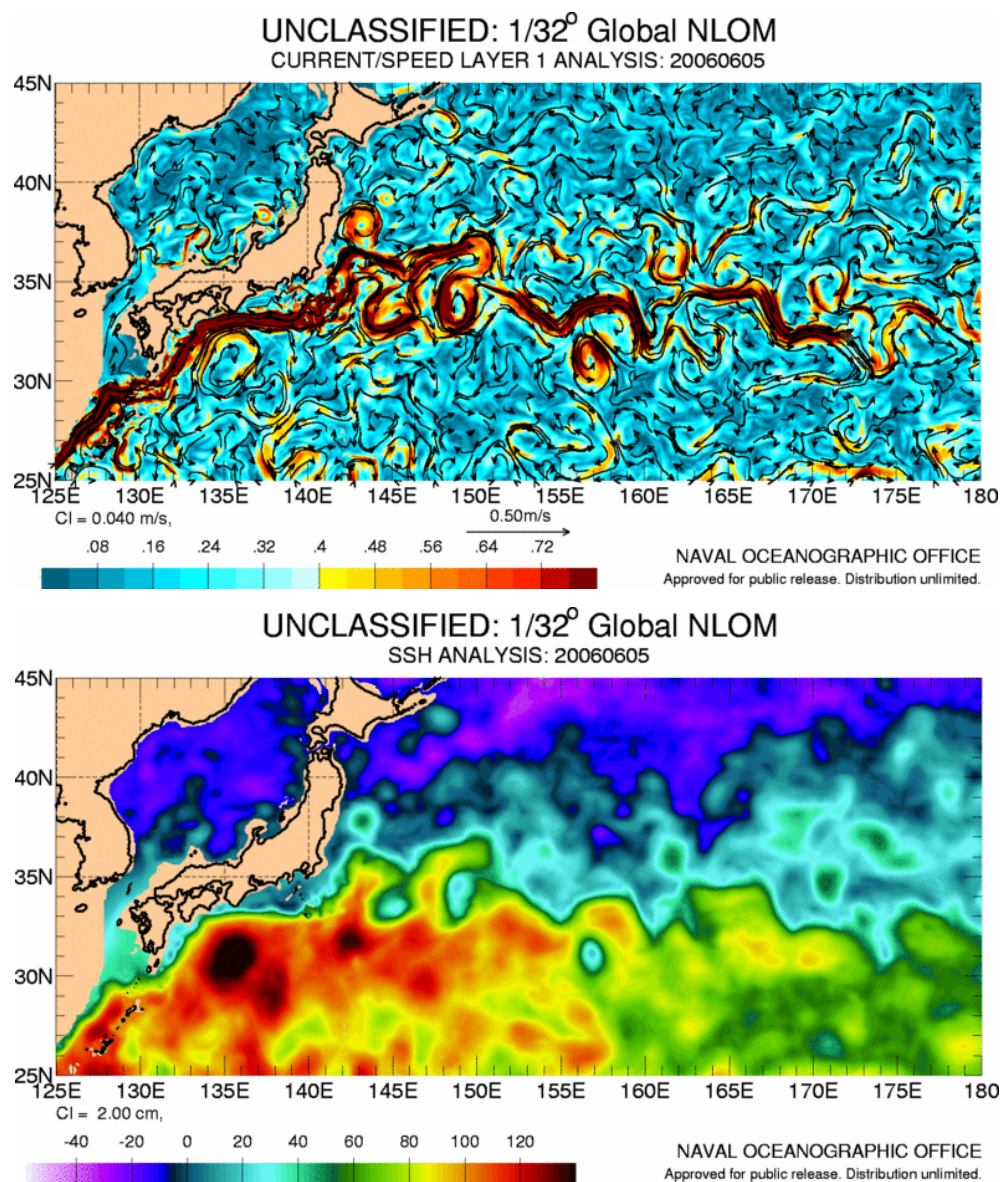


Figure 35: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region at the beginning of the first feature survey 6/5/2006.

http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

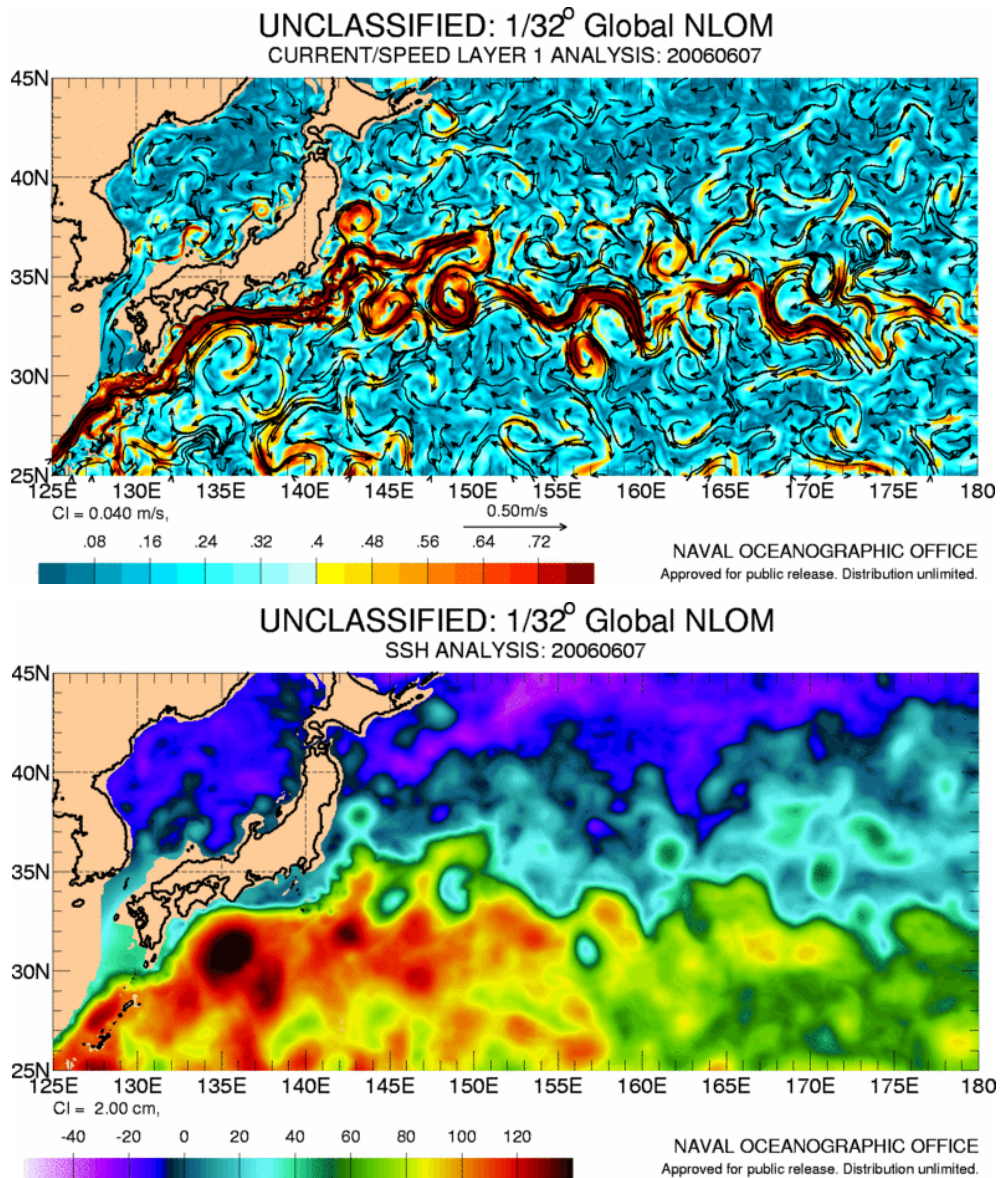


Figure 36: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region at the end of the first feature survey 6/7/2006.
http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

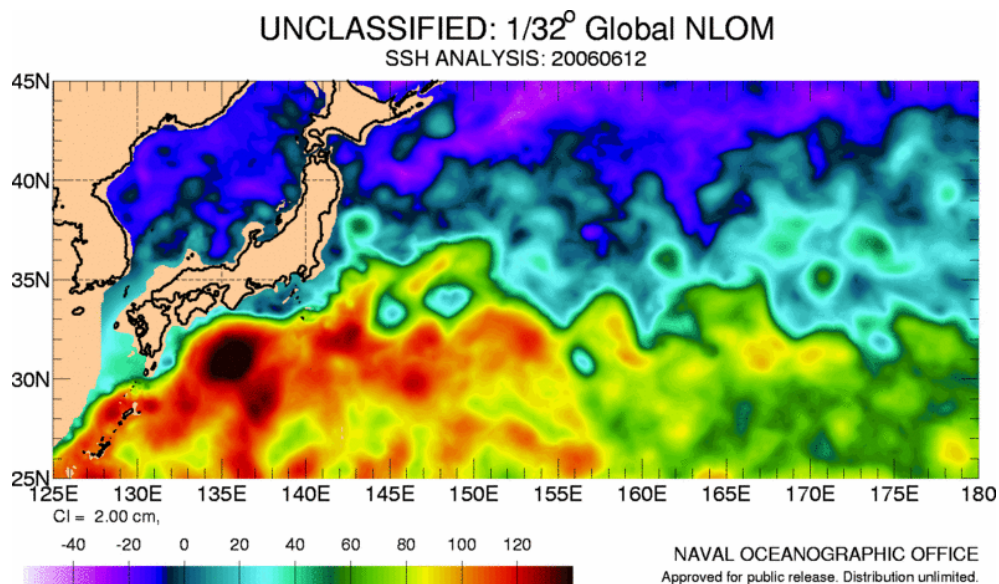
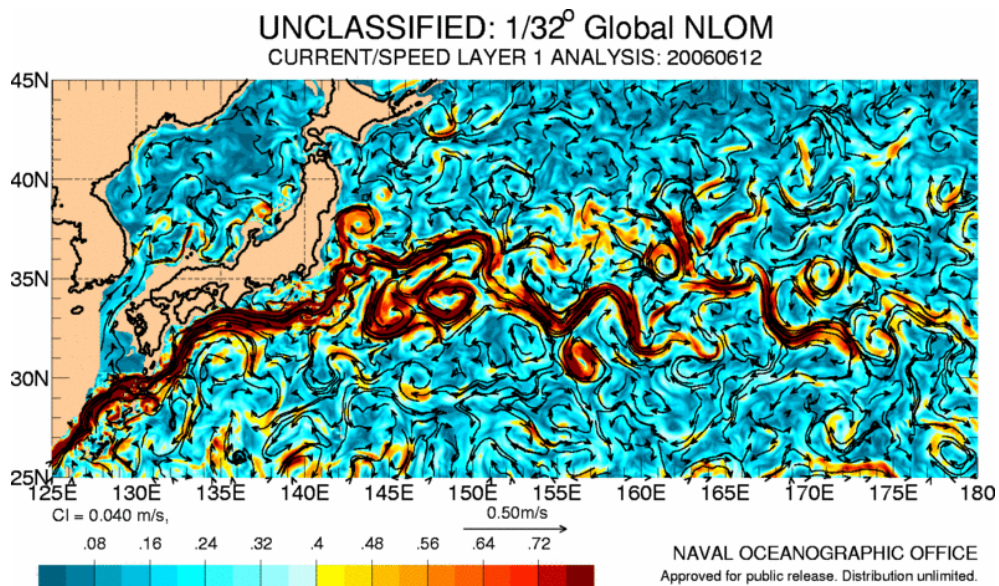


Figure 37: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region 6/12/2006.

http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

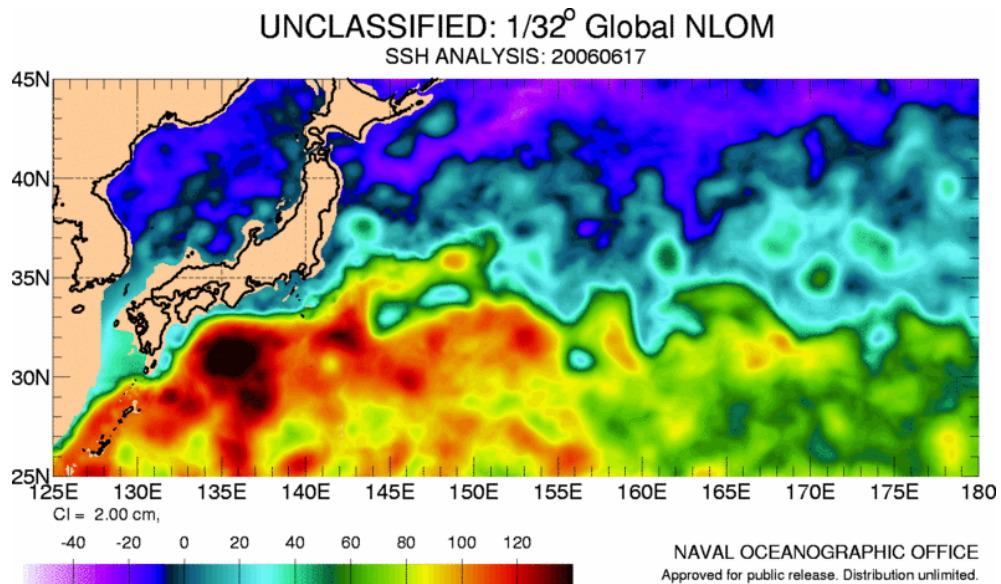
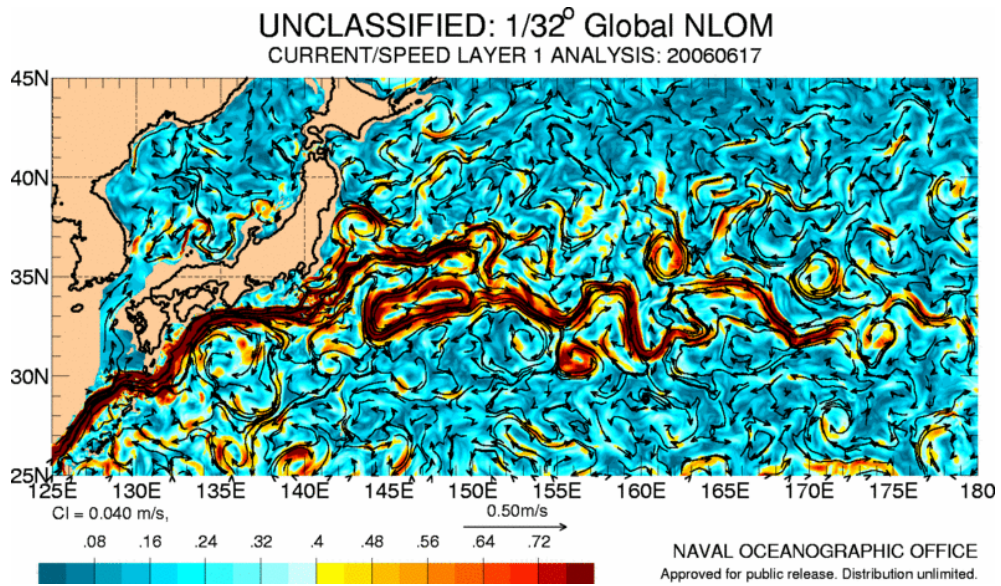


Figure 38: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region 6/17/2006.

http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

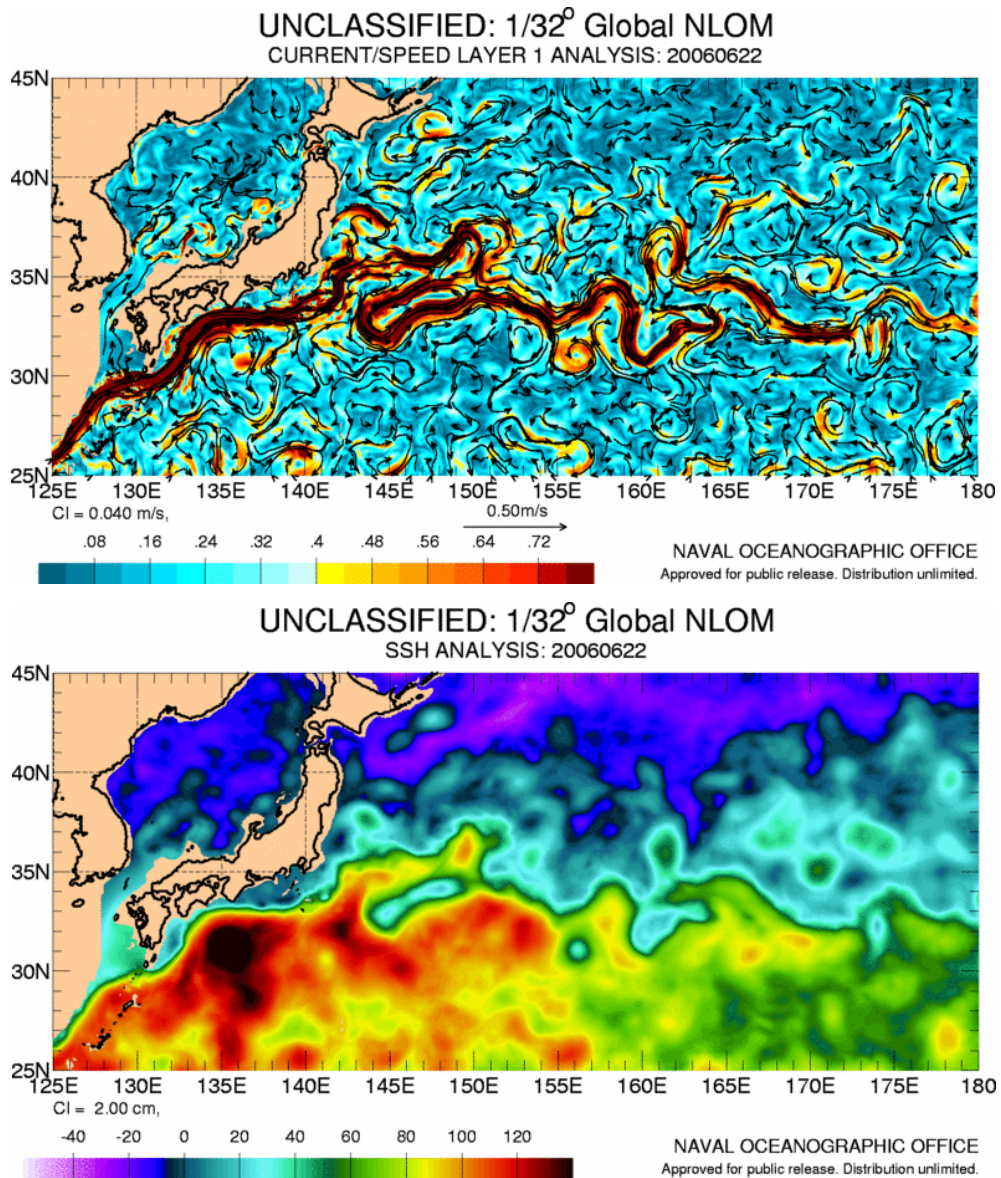


Figure 39: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region 6/22/2006.

http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

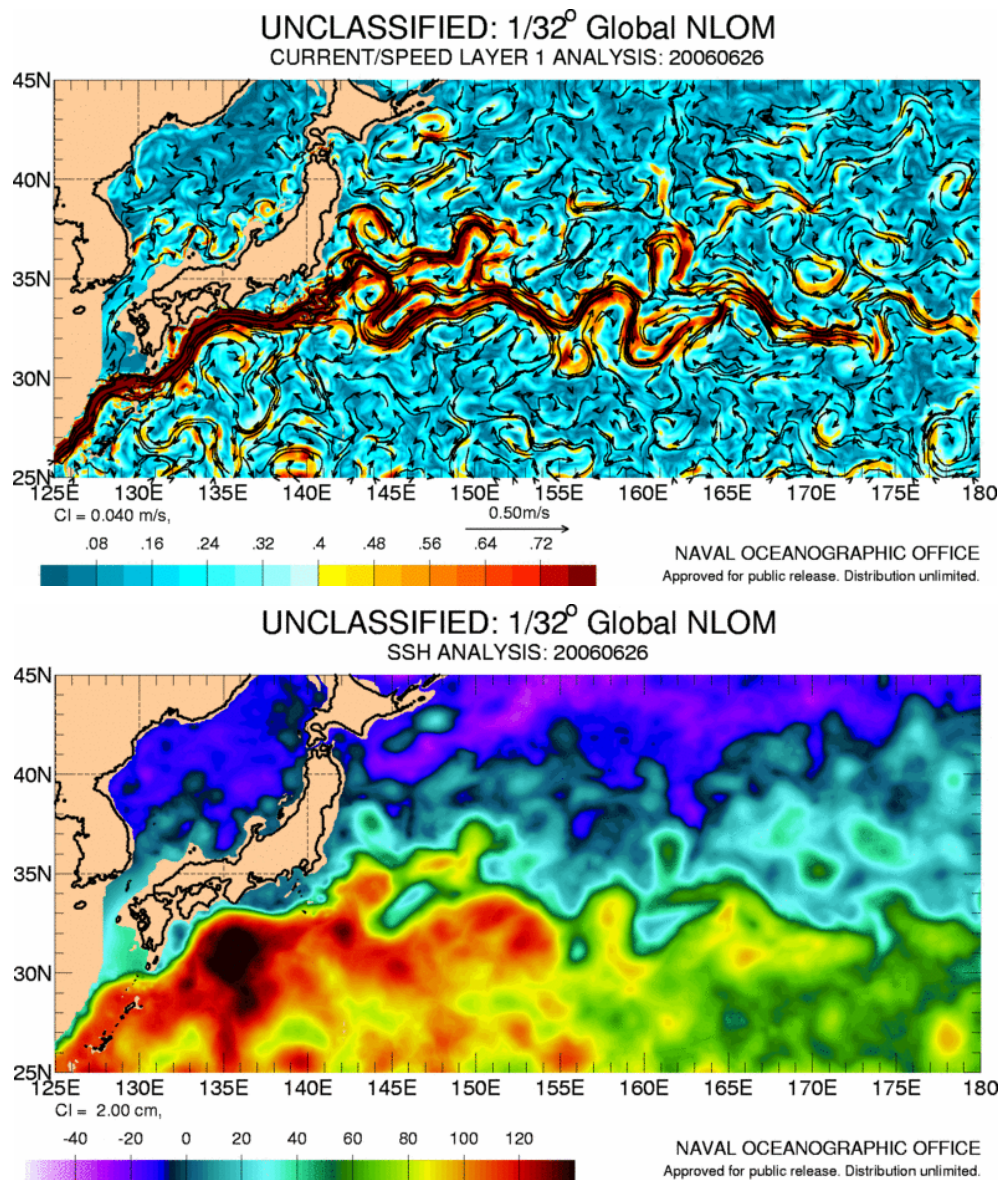


Figure 40: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region at the beginning of the second feature survey 6/26/2006.
http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

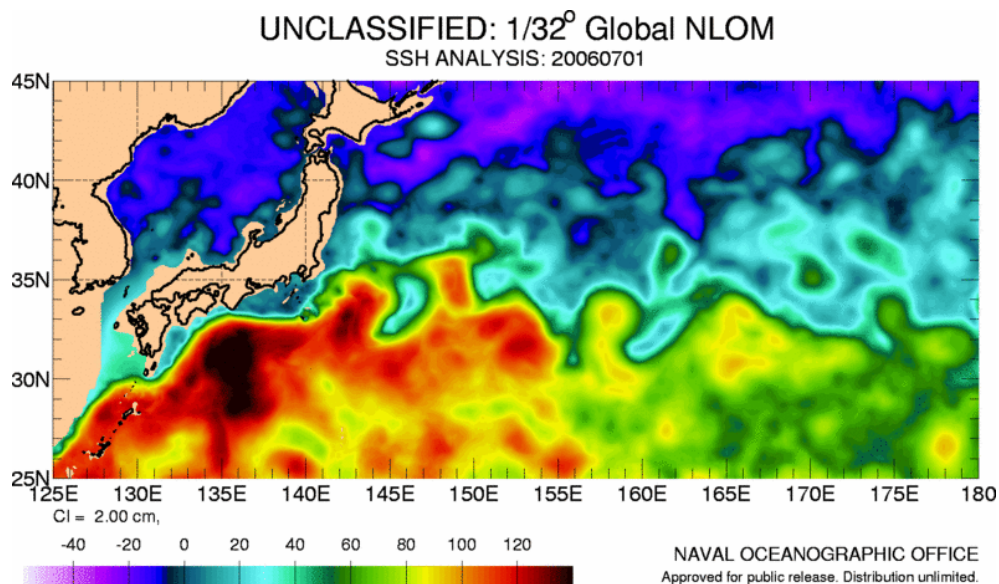
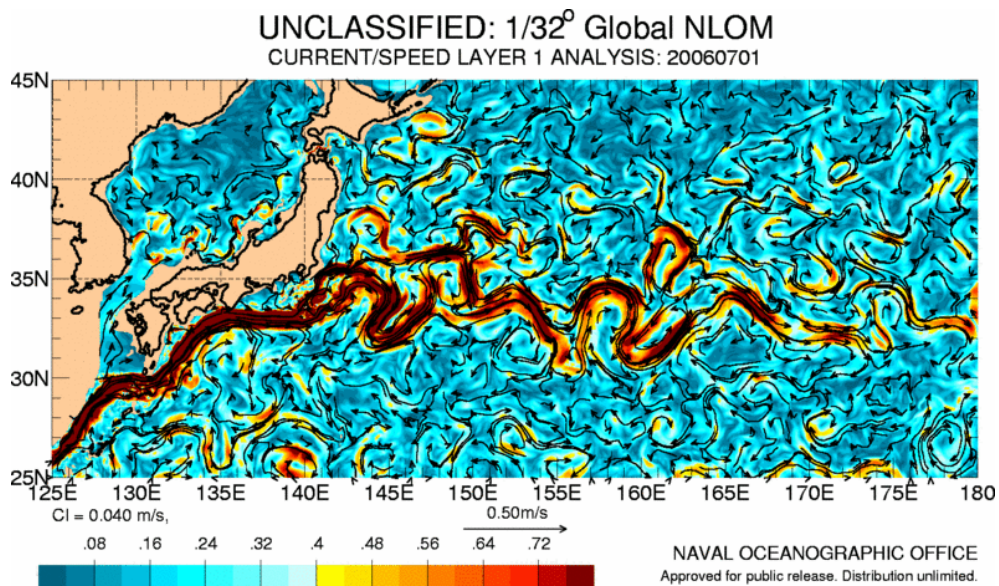


Figure 41: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region in the middle of the second feature survey 7/1/2006.
http://www7320.nrlssc.navy.mil/global_nlom32/kur.html

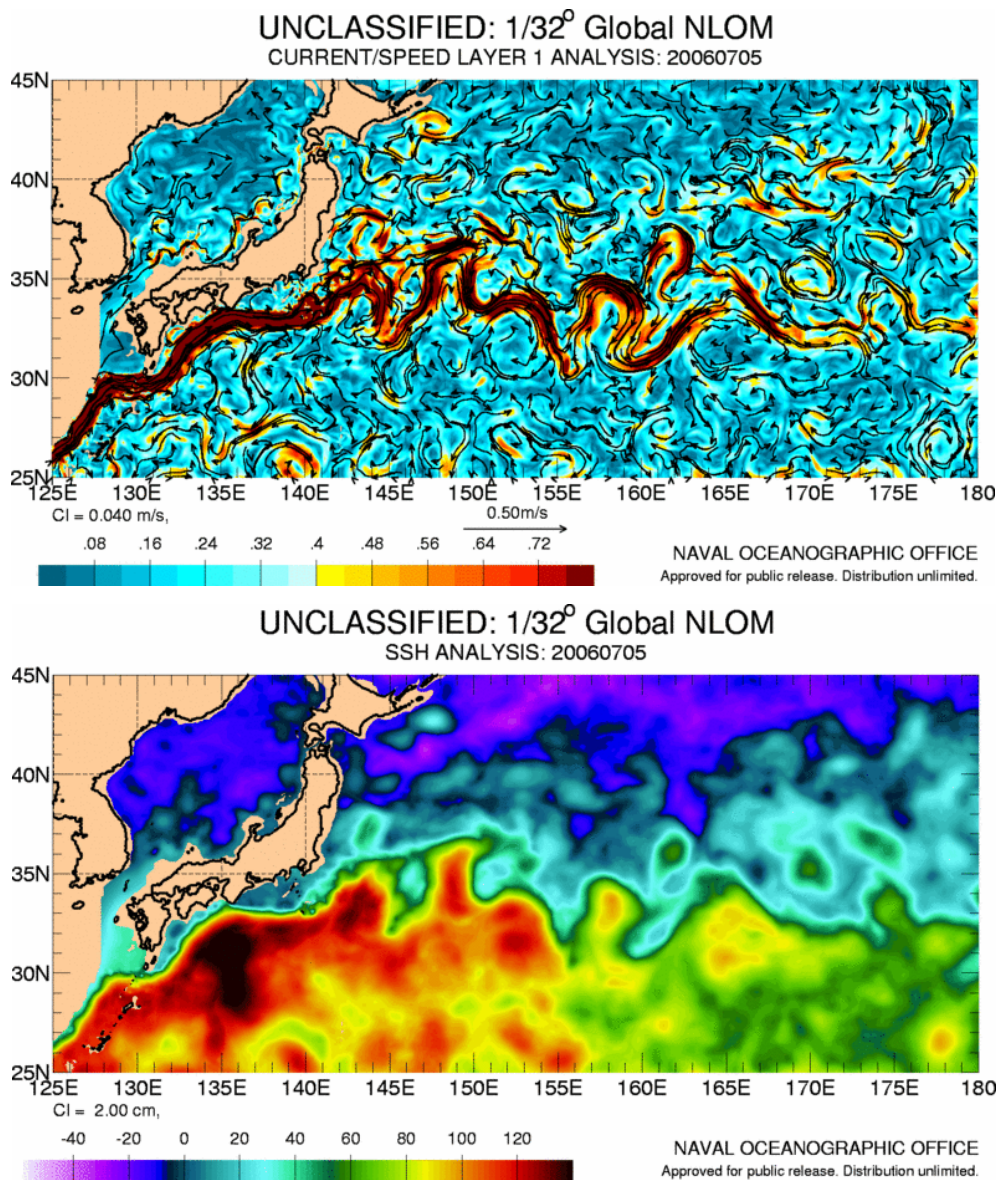


Figure 42: NLOM 1/32° Global Model Current/Speed (top) and SSH (bottom) Nowcast Snapshot for the Kuroshio region at the end of the second feature survey 7/5/2006.
http://www7320.nrlssc.navy.mil/global_nlom32/kur.html