Sentry Operations Report for the AT40-02 Kurz Cruise DRAFT

WHOI Sentry Operations Group
Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

R/V Atlantis — May 11th, 2018 to June 10th, 2018

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1 Summary

This document summarizes operations with the *Sentry* autonomous underwater vehicle (AUV) during the AT40-02 Kurz cruise. Included in this report is the vehicle configuration; basic vehicle and sensor performance; and post-dive reports (with summary statistics and narratives). This report does not attempt to describe the scientific results or conclusions. A detailed description of the data files resulting from this cruise is provided in a separate document. Individual dive summaries for Sentry dives 473 - 489 follow — each of these is a free-standing document summarizing the dive.

2 Cruise Log

This section provides a brief chronological summary of *Sentry* activities during the cruise. Additional information on specific dives is available in the dive reports.

11 MAY 2018 Depart St. Georges Bermuda for Mid-Atlantic Ridge.

12 APR 2018 Transit

13 APR 2018 Transit

14 MAY 2018 Transit

15 MAY 2018 Transit

16 MAY 2018 Transit. Atlantis stopped to perform dunk test of strobe bottle.

17 MAY 2018 Arrived on station 08:00 Local. Deploy Sentry473 on popping rocks ridge.

18 MAY 2018 Recover Sentry473. Deploy Sentry474 on popping rocks ridge. Deploy waveglider.

19 MAY 2018 Recover Sentry474. Deploy Sentry475 on popping rocks ridge.

20 MAY 2018 Recover Sentry475. Deploy Sentry476 at core complex.

21 MAY 2018 Recover Sentry476. Deploy Sentry477 on popping rocks ridge.

22 MAY 2018 Recover Sentry477. Deploy Sentry478 on popping rocks ridge.

23 MAY 2018 Recover Sentry478. Deploy Sentry479 on core complex.

24 MAY 2018 Recover Sentry479. Deploy Sentry480 on popping rocks ridge.

25 MAY 2018 Recover Sentry480. Deploy Sentry481 on area4.

26 MAY 2018 Recover Sentry481. Deploy Sentry482 at area4.

27 MAY 2018 Recover sentry482. Deploy Sentry483 at core complex.

28 MAY 2018 Recover Sentry483. Deploy Sentry484 at core complex.

29 MAY 2018 Recover Sentry484. Deploy Sentry485 in area5.

30 MAY 2018 Recover Sentry485. Deploy Sentry486 in area4.

31 MAY 2018 Recover Sentry486. Deploy Sentry487 in area2. Recover waveglider.

01 JUN 2018 Recover Sentry487. Deploy Sentry488 in Area1. Deploy waveglider.

02 JUN 2018 Sentry dive continued.

03 JUN 2018 Recover Sentry488. Deploy Sentry489 in area2.

04 JUN 2018 Recover waveglider, recover Sentry489. Begin transit to St. Georges Bermuda.

05 JUN 2018 Transit to Bermuda.

06 JUN 2018 Transit to Bermuda.

07 JUN 2018 Transit to Bermuda.

08 JUN 2018 Transit to Bermuda.

09 JUN 2018 Transit to Bermuda.

10 JUN 2018 Arrive Bermuda.

3 Vehicle Configuration

4 Navigation

All dives were navigated using real time Doppler Velocity Log (DVL) velocity inertial measurement unit (IMU) attitude measurements. External aiding during descent was performed with Ultra-Short Baseline (USBL) throughout the cruise. Dive specific notes on navigation are included in the dive reports. All final navigation consists of a track where the DVL/IMU track was fused with the USBL fixes in post-processing.

4.1 Coordinate origins

The vehicle's control system uses simple equidistant coordinates. This system uses an origin, defined in terms of latitude and longitude with the World Geodetic System 1984 (WGS84) datum, and a fixed scaling between meters displacement from the origin. We use the identical routines that have been used by the National Deep Submergence Facility (NDSF) assets Alvin and Jason for decades. Likewise we always used the same origin for Sentry and Alvin at each site. These simple coordinates have several advantages for realtime control of a vehicle. Unlike Universal Transverse Mercator (UTM) grid coordinates, the x and y axes intersect at right angles and align with true east and north respectively at the origin. These coordinates distort quickly as one moves away from the origin, but we solve that problem by putting the origin close to the operating area. We almost always report our results in latitude/longitude, so most users need not be aware of these details.

4.2 USBL Calibration and Performance Notes

A CASIUS calibration of the USBL system was not conducted during this cruise. A casius was performed on AT40-01.

5 Items of Note

This section summarized details which are worthy of note or mention for future reference but which do not constitute problems:

N.1: Software: This was the first science cruise to utilize the ROS architecture. There were no major issues observed from running with the ROS software.

N.2: Freewave: Wireless communications to and from the vehicle on the surface were improved from the additional tail added to Sentry.

N.3: Waveglider: Waveglider operations were conducted throughout the cruise. The waveglider was used to supplement Sentry operations, providing additional status updates from Sentry through the iridium network.

N.4: USBL tracking: The USBL sonardyne transceiver head was replaced before leaving Woods Hole in April. Throughout this cruise, tracking of Sentry worked well without any issues. The SMS messaging

Sentry uses through the Sonardyne system would occasionally cause the transciever head to fail. Turning off the SMS messaging would cause the transciever head to come back and start working again. The root cause is difficult to determine. It is possible this is an issue with using a 5G transciever head with a 6G NCU and computer.

N.5: Datapod: Following dive sentry488, the datapod showed signs of hardware failure with I/O errors, and lack of forward looking sonar log files. The datapod was switched out before sentry489.

N.6: Concurrent Ops: Concurrent operations with Alvin and Sentry was completed during this trip for a single dive. Future operations should include extensive planning of dive times, locations and logistics in order to ensure success.

6 Ship Specific Information

This section summarizes ship specific information factual, good, and bad and is meant primarily to facilitate more effective use of the same vessel in the future.

S.1: Sentry Nav station and personnel were stationed in the port side hydrolab.

S.2: Whifflenav was connected to the port SP23 transducer. This transducer appears to have more noise on it when listening through the Alvin UQC. It is not clear what the issue with the noise is, but it worked well for our Sentry dives.

S.3: uModem was connected to ITC transducer on the hull.

S.4: Sentry control van was port side aft on the main deck. Blue spare van, inboard 01 deck port side.

S.5: Starboard crane was used for Sentry deployment and recovery.

7 Technical Issues

This section summarizes technical issues encountered by the *Sentry* operations group on the cruise. Issues which affected primarily individual dives are listed in the individual dive reports.

T.1: Optode: The Andreaa optode, an oxygen sensor based on fluorescence quenching, would intermittently stop sending data. After a period of time, the sensor will start sending data again, but gaps in the dive data do occur. A power cycle is the only fix to this problem. The spare Optode does not accept commands and is not suitable as a spare.

8 Acknowledgments

1. Thank you to NSF for funding this expedition.

2. Thank you to the Captain and crew of the R/V Atlantis for safe operations and support.

9 Comments from Science

Sentry 473 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 15 to 20 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry473 launch position: 13 46.850'N 045 0.511'W

Narrative

Sentry473 was the first dive of the cruise. This survey covered an area of 1km by 2km in area1. Deck-test,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3700m. Once on bottom, Sentry was shifted onto the planned track line and started running its planned mission for the duration of the dive. Sentry completed the large multibeam block after 8 hours on the bottom. After starting the second multibeam block to the west of the first multibeam block, Sentry was aborted after completing two survey lines. Sentry was aborted from the surface to ensure an on time arrival for Alvin operations. Sentry was in the water for a total of 12 hours, capturing 9 hours of multibeam and sidescan data. There were no maggie calibration spins on this dive.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.1 sentry473 Summary

sentry473 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/17 20:34:14
Survey start: 2018/05/17 22:14:42
Survey start: Lat:13.781435 Lon:-45.010469
Survey start: Lat:13 46.886'N Lon:045 0.628'W
Survey end: 2018/05/18 07:14:47
Survey end: Lat:13.788069 Lon:-45.020673
Survey end: Lat:13 47.284'N Lon:045 1.240'W
Ascent begins: 2018/05/18 07:14:47
On the surface: 2018/05/18 08:25:24
On deck: 2018/05/18 08:37:25
descent rate: 37.7 m/min
ascent rate: 51.9 m/min
survey time: 9.0 hours
deck-to-deck time 12.1 hours
Min survey depth: 3385m
Max survey depth: 3865m
Mean survey depth: 3615m
Mean survey height: 83m
distance travelled: 30.33km
average speed: 0.92m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.92 m/s over 30.33 km
total vertical during survey: 7520m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.0 kwhr
Battery energy at survey end: 11.1 kwhr
Battery energy on surface: 11.0 kwhr
Battery energy on deck: 10.9 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry473/nav-sci/proc directory within the sentry473_config matlab structure as well as in ascii text logs in sentry473/metadata. At present metadata is not yet automatically collected on all sensors.

0.2 sentry473 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180517_1807.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180517_1808.cfg`
CTD	SBE 49	260		`sbe49_20180517_1808.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180517_1808.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

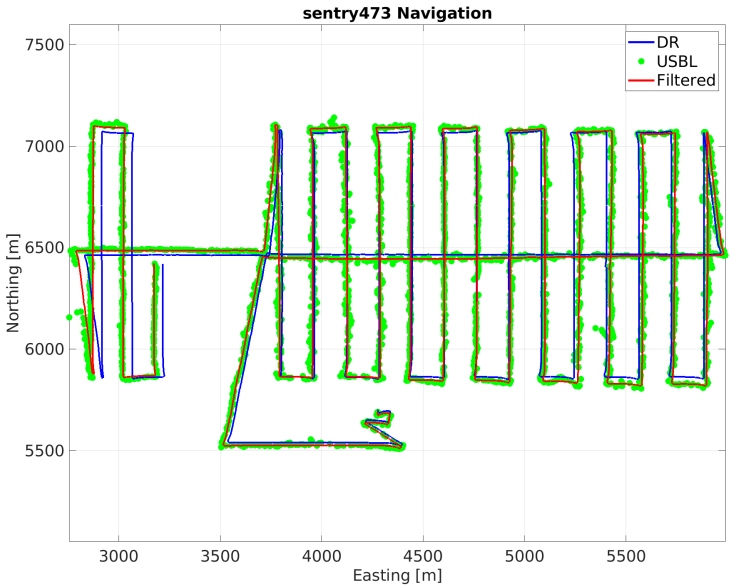


Figure 1: Latitude/Longitude plot of Sentry dive 473 based on post-processed navigation

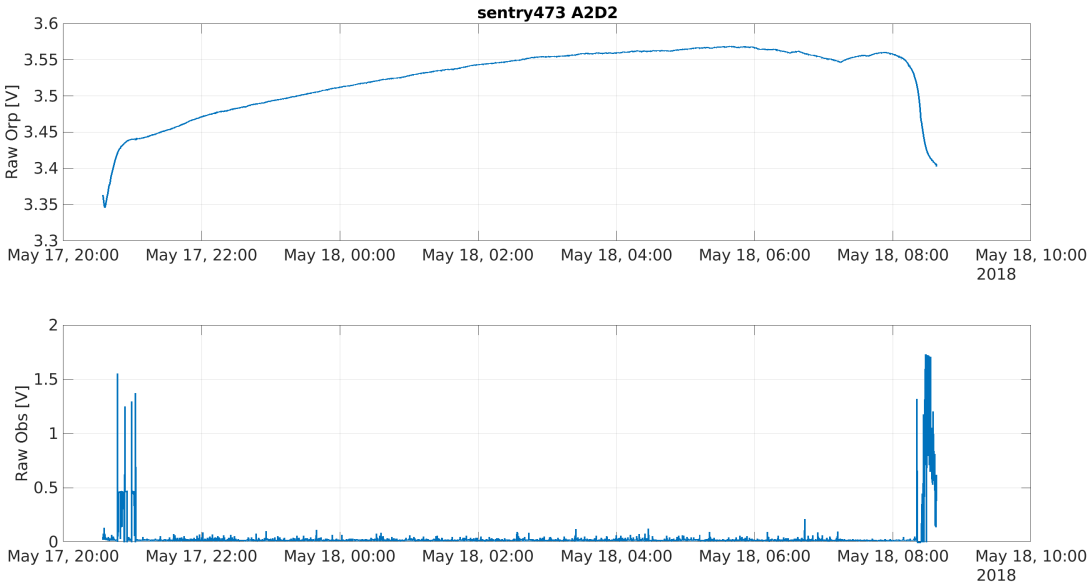


Figure 2: Raw analog Sensor Data

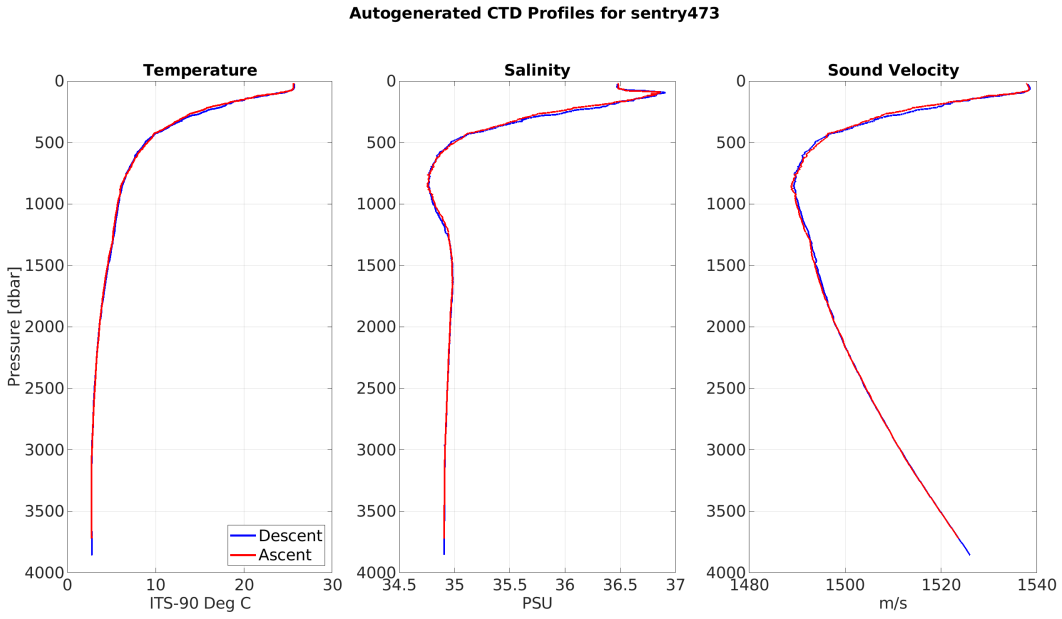


Figure 3: CTD profile sensor data

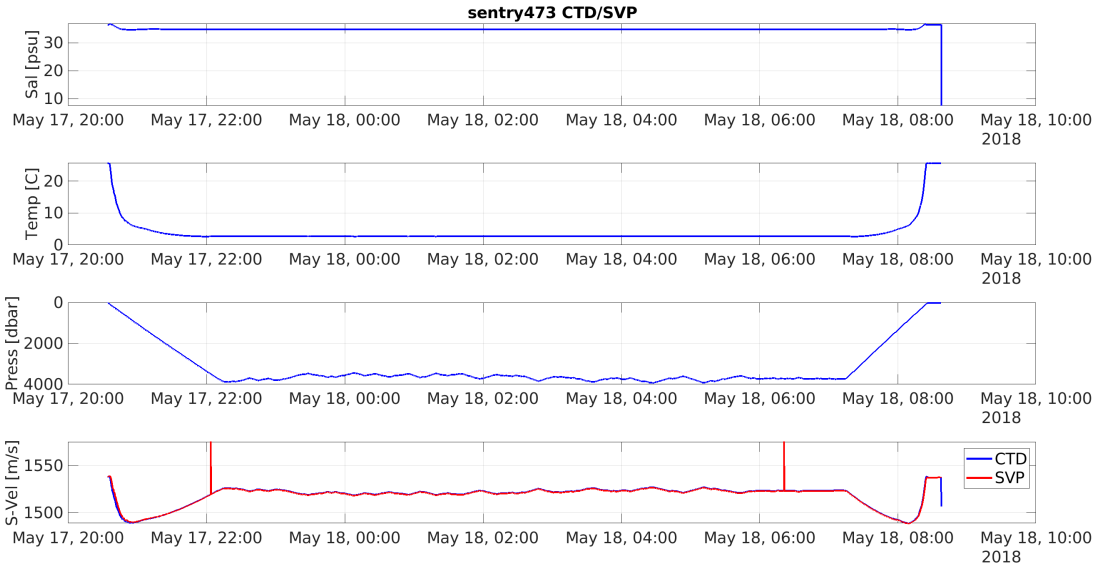


Figure 4: CTD and SVP sensor data

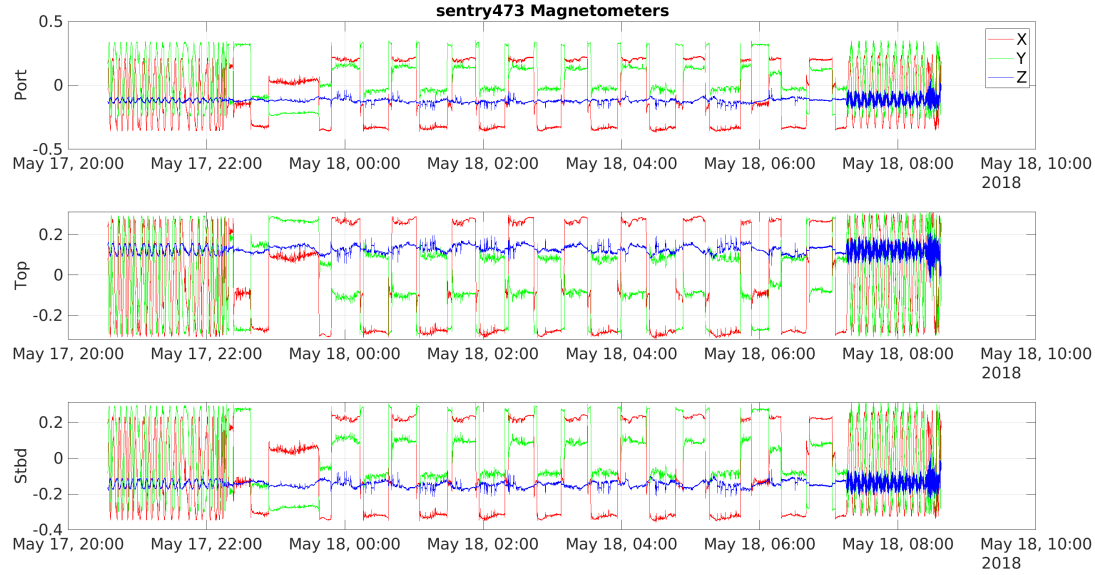


Figure 5: Magnetometer data from each of the three magnetometers on Sentry

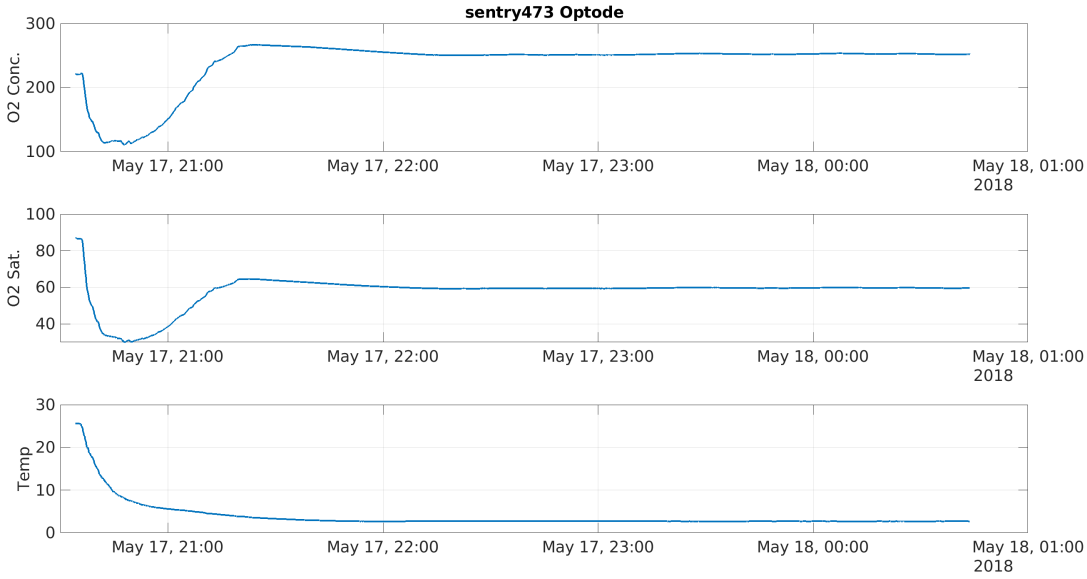


Figure 6: Optode temperature, O2 saturation, and concentration

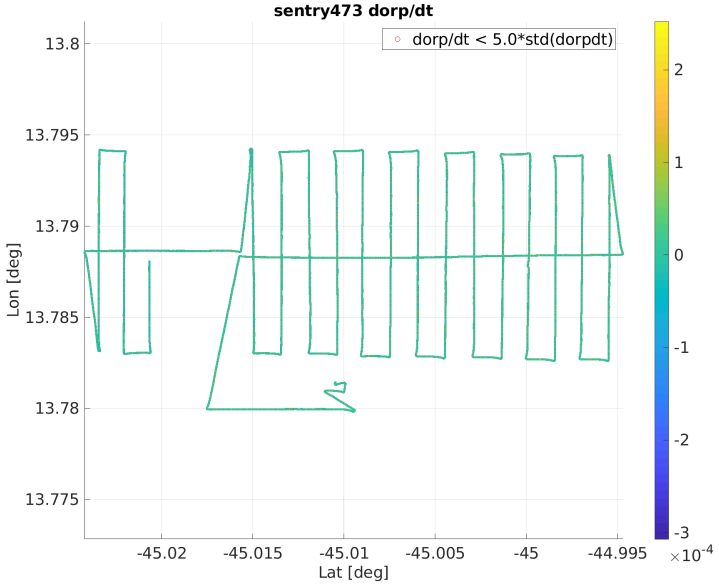


Figure 7: Navigated ORP sensor data.

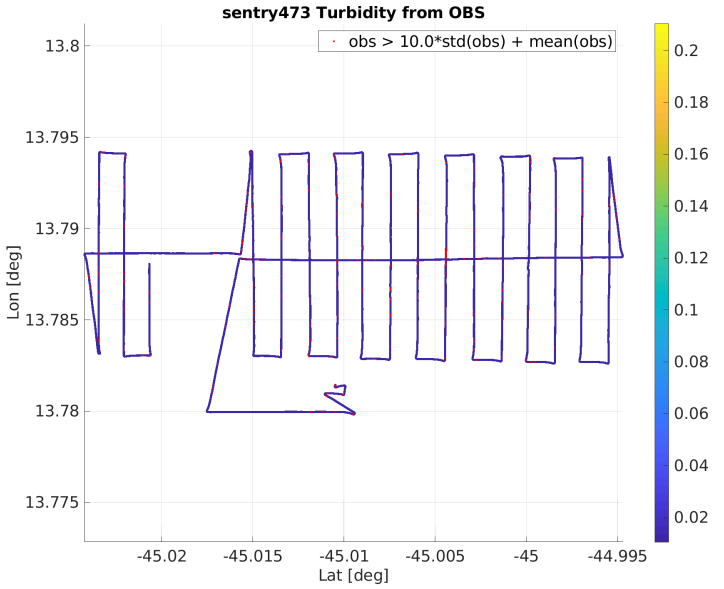


Figure 8: Navigated OBS sensor data.

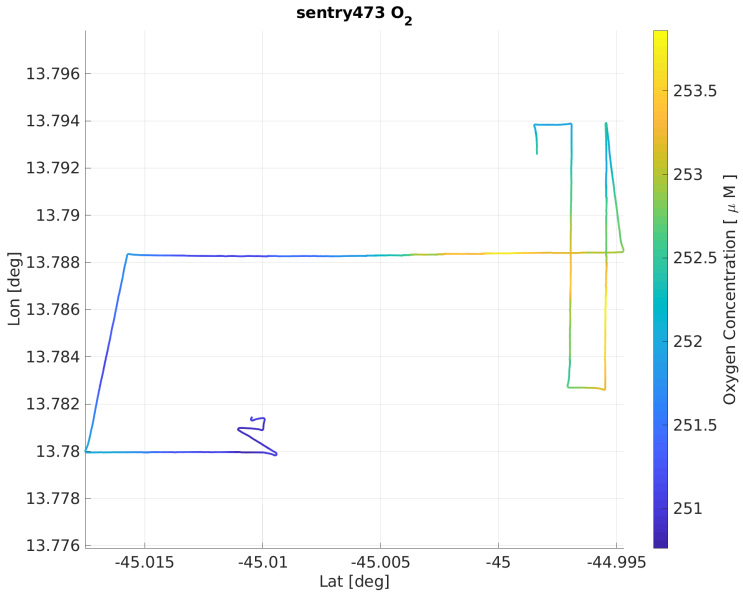


Figure 9: Navigated optode sensor data.

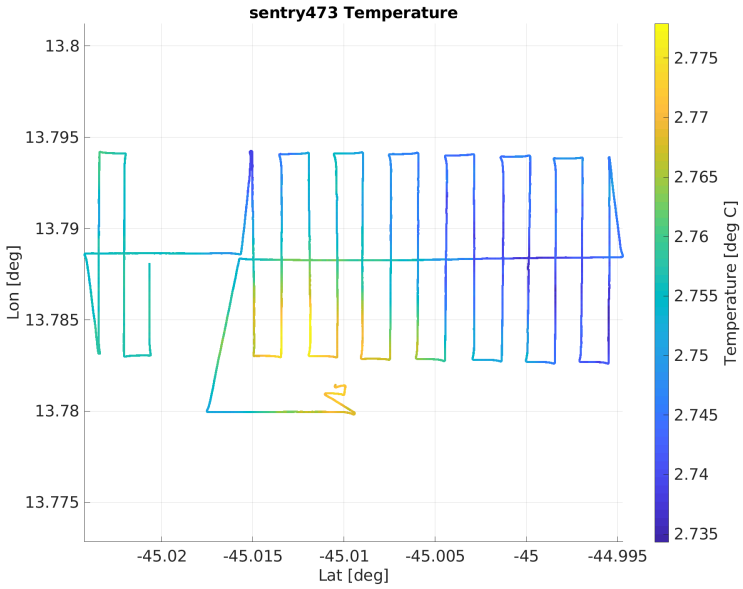
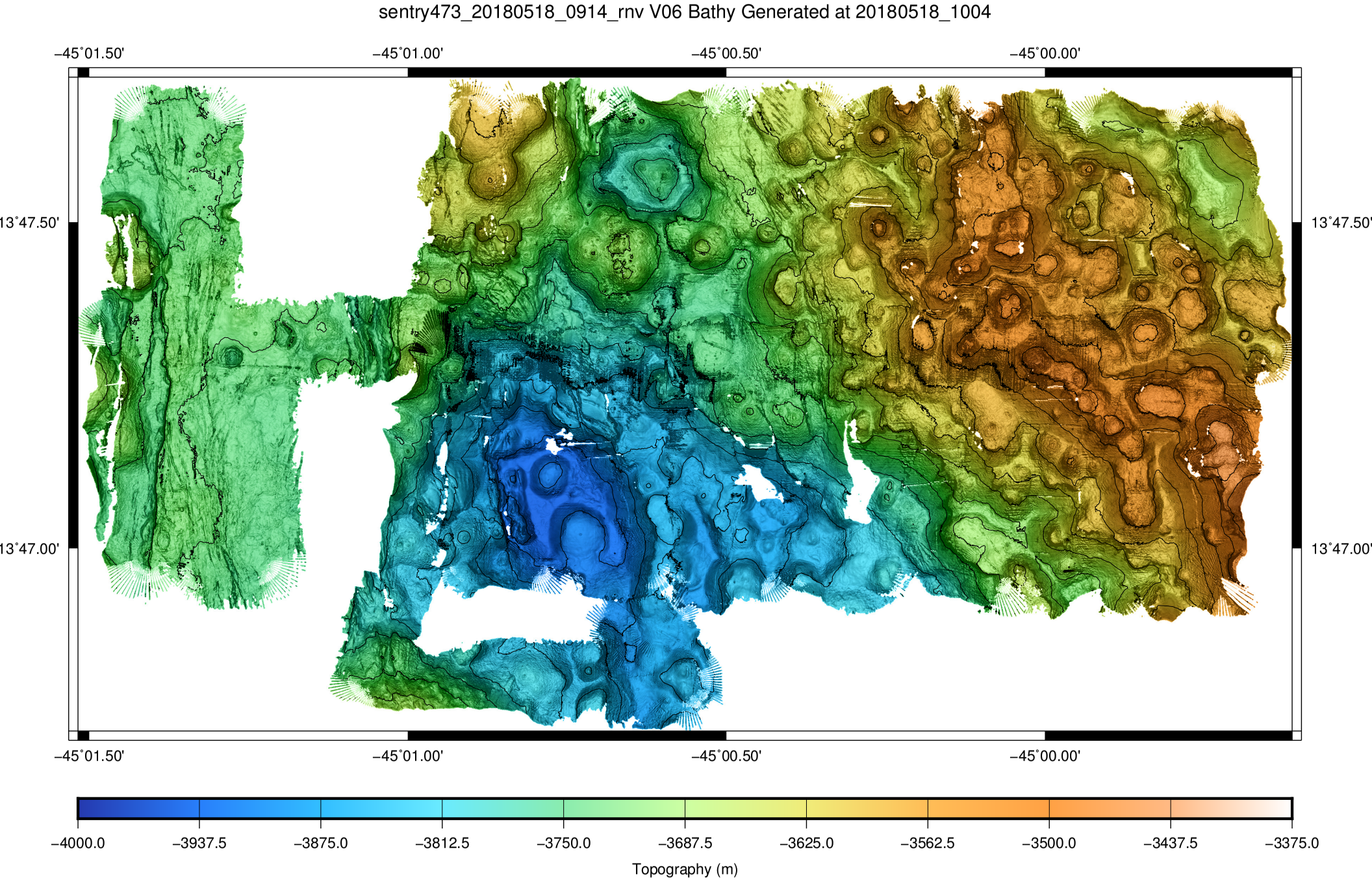


Figure 10: Navigated temperature sensor data


sentry473_20180518_0914_rnv V06 Bathy Generated at 20180518_1004
−45˚01.50'
−45˚01.00'
−45˚00.50'
−45˚00.00'
13˚47.50'
13˚47.00'
−4000.0
−3937.5
−3875.0
−3812.5
−3750.0
−3687.5
−3625.0
−3562.5
−3500.0
−3437.5
−3375.0
Topography (m)

Sentry 474 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 15 to 20 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry474 launch position: 13 45.500'N 045 1.106'W

Narrative

Sentry474 was the second dive of the cruise. This dive surveyed an area of 2.3km by 1km in area1. The survey area was just south of existing high resolution bathy from previous Sentry dives. Two extra survey lines were completed to fill in 'holes' from the 2016 high resolution bathy.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3700m. Once Sentry was greater than 200m depth and descending, the wave glider was launched. Overall this dive went very well, capturing most of the intended survey area. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

This was the first dive with the waveglider in the water. The waveglider was launched to interface with Sentry and the ship and act as a relay between the two vessels. This dive was able to connect Sentry to ship through the micromodem on Sentry and the waveglider. The acoustic messages sent by Sentry were relayed from the waveglider successfully over the iridium network to the Atlantis. The waveglider was commanded to a standoff distance to ship and Sentry of 7km horizontally for most of the dive. Acoustic comms with Sentry continued to work at this distance.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.3 sentry474 Summary

sentry474 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/18 20:34:51
Survey start: 2018/05/18 22:14:40
Survey start: Lat:13.759392 Lon:-45.020951
Survey start: Lat:13 45.564'N Lon:045 1.257'W
Survey end: 2018/05/19 07:15:30
Survey end: Lat:13.760978 Lon:-45.019819
Survey end: Lat:13 45.659'N Lon:045 1.189'W
Ascent begins: 2018/05/19 07:15:30
On the surface: 2018/05/19 08:27:46
On deck: 2018/05/19 08:47:07
descent rate: 37.8 m/min
ascent rate: 52.6 m/min
survey time: 9.0 hours
deck-to-deck time 12.2 hours
Min survey depth: 3413m
Max survey depth: 3848m
Mean survey depth: 3651m
Mean survey height: 80m
distance travelled: 31.31km
average speed: 0.94m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.94 m/s over 31.31 km
total vertical during survey: 6483m
Battery energy at launch: 20.6 kwhr
Battery energy at survey start: 19.8 kwhr
Battery energy at survey end: 11.3 kwhr
Battery energy on surface: 11.1 kwhr
Battery energy on deck: 10.9 kwhr

Sensor Information

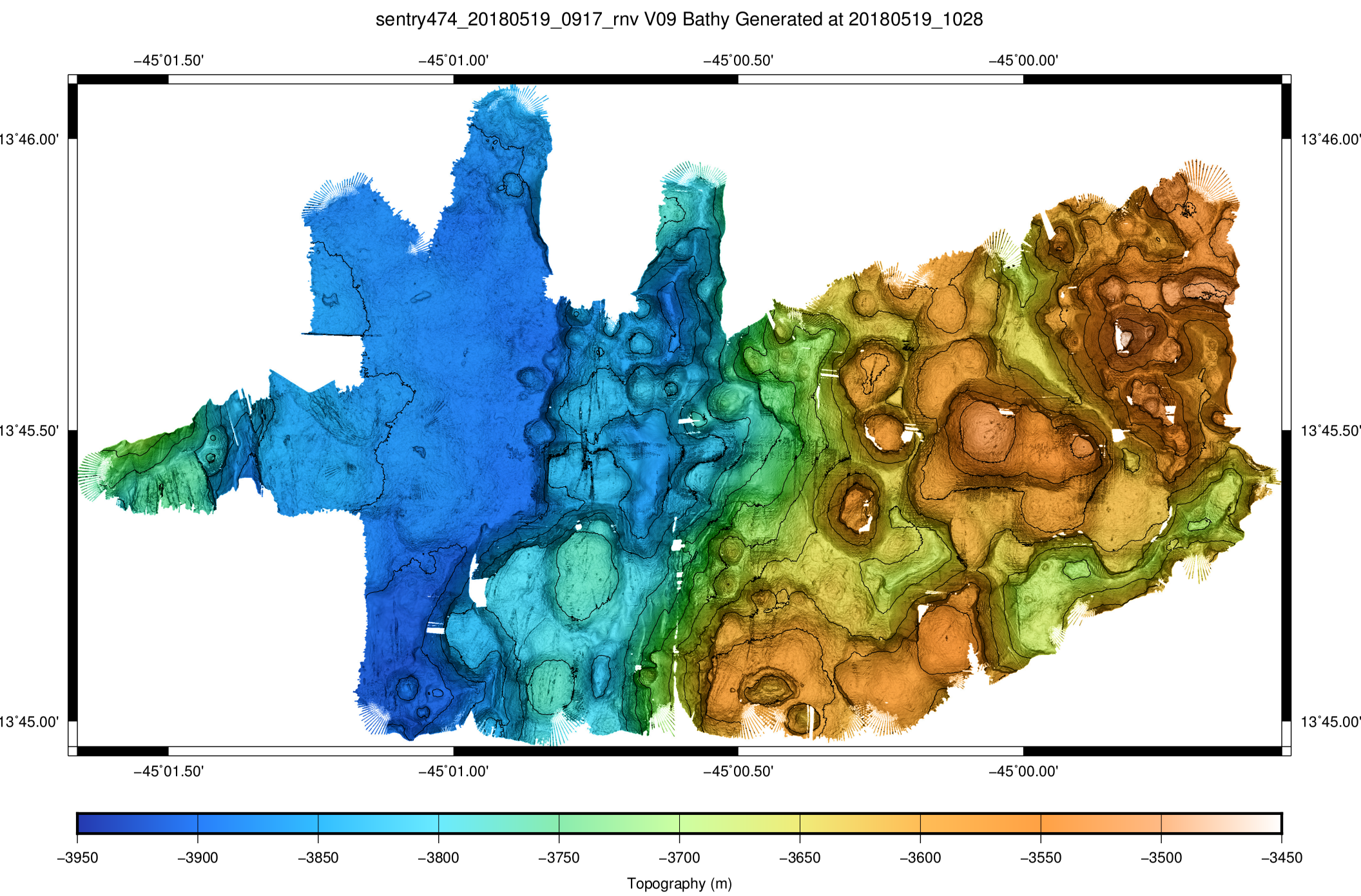
This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry474/nav-sci/proc directory within the sentry474_config matlab structure as well as in ascii text logs in sentry474/metadata. At present metadata is not yet automatically collected on all sensors.

0.4 sentry474 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180518_1813.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180518_1814.cfg`
CTD	SBE 49	260		`sbe49_20180518_1814.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180518_1813.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.


sentry474_20180519_0917_rnv V09 Bathy Generated at 20180519_1028
−45˚01.50'
−45˚01.00'
−45˚00.50'
−45˚00.00'
13˚46.00'
13˚45.50'
13˚45.00'
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−3450
Topography (m)

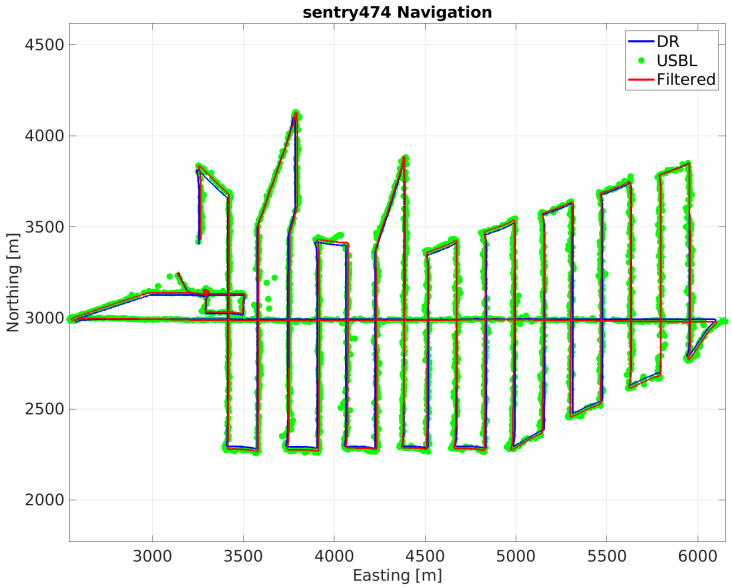


Figure 11: Latitude/Longitude plot of Sentry dive 474 based on post-processed navigation

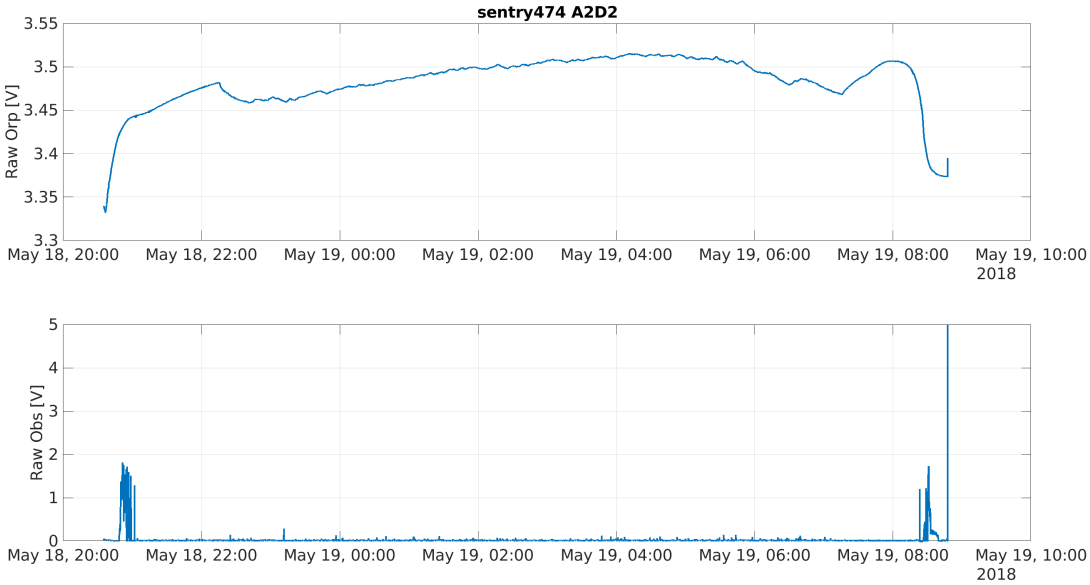


Figure 12: Raw analog Sensor Data

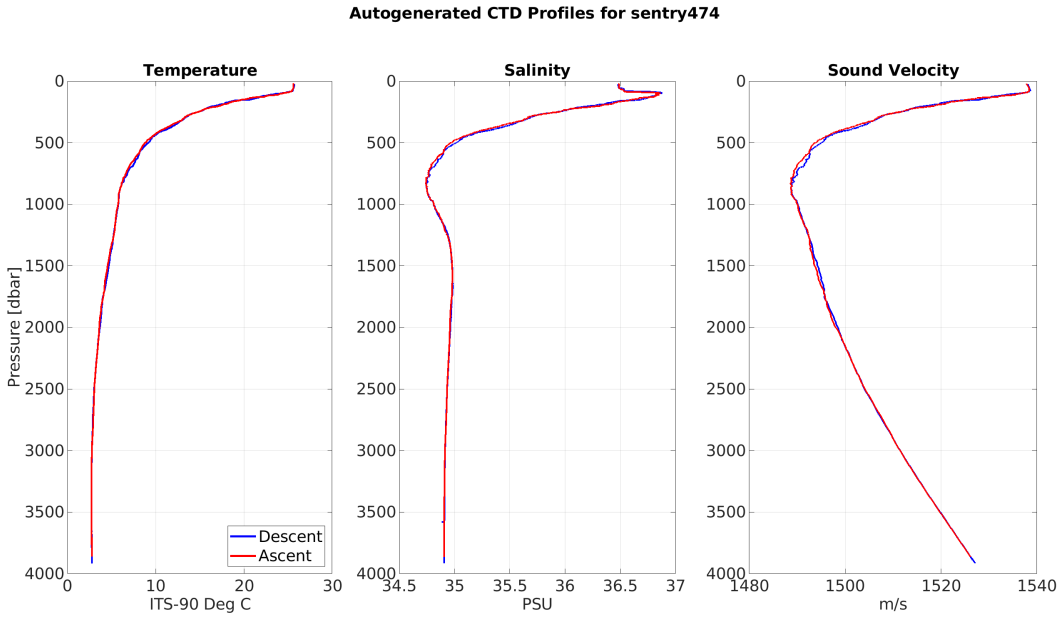


Figure 13: CTD profile sensor data

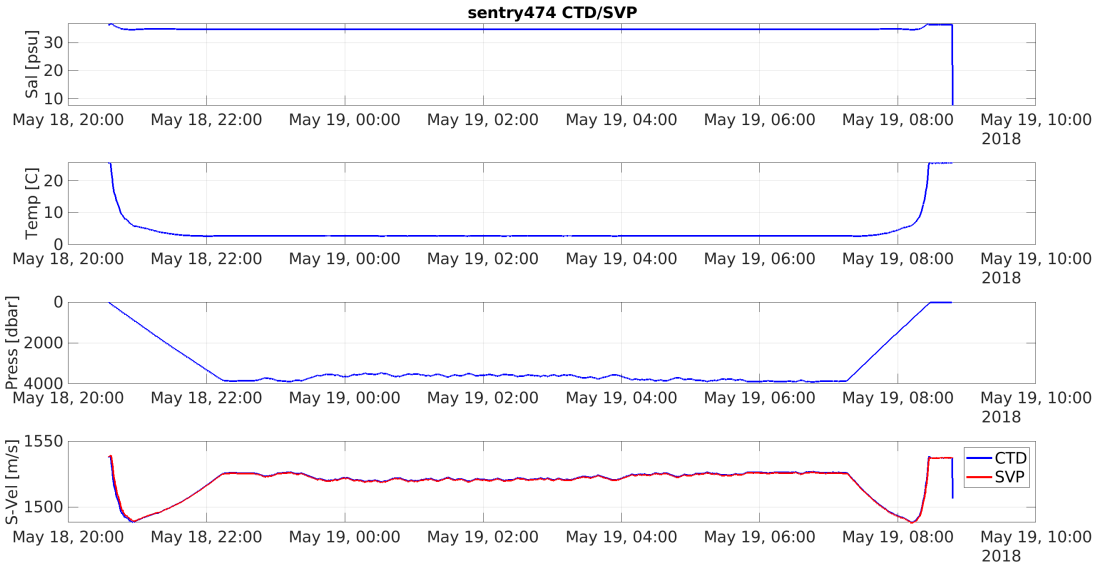


Figure 14: CTD and SVP sensor data

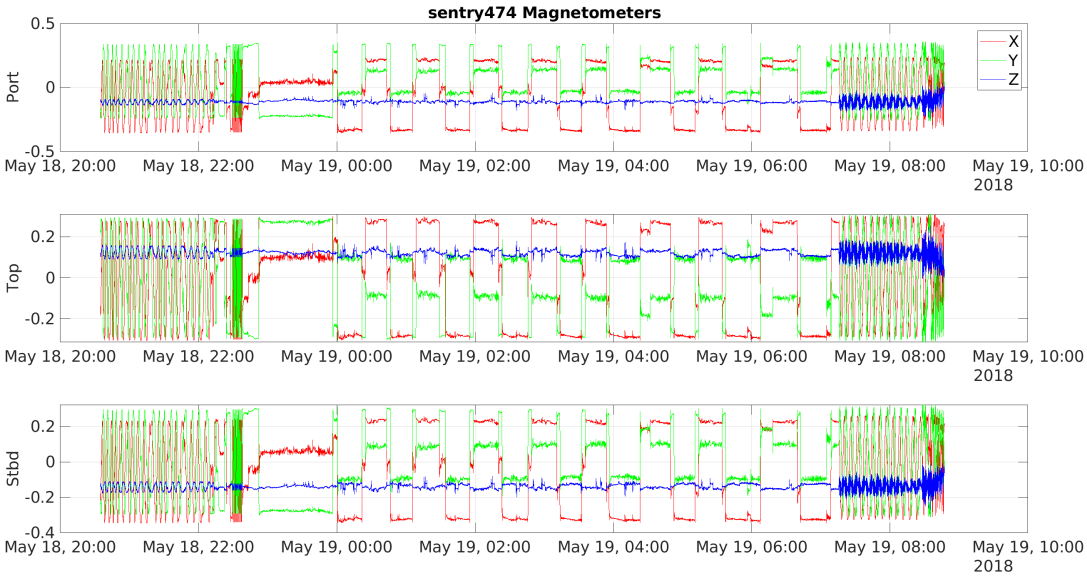


Figure 15: Magnetometer data from each of the three magnetometers on Sentry

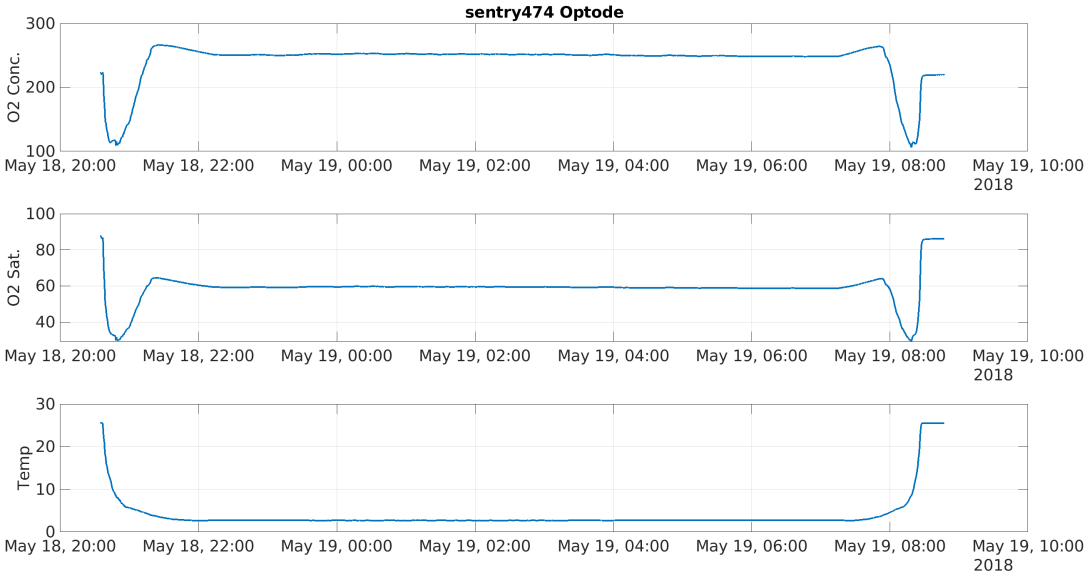


Figure 16: Optode temperature, O2 saturation, and concentration

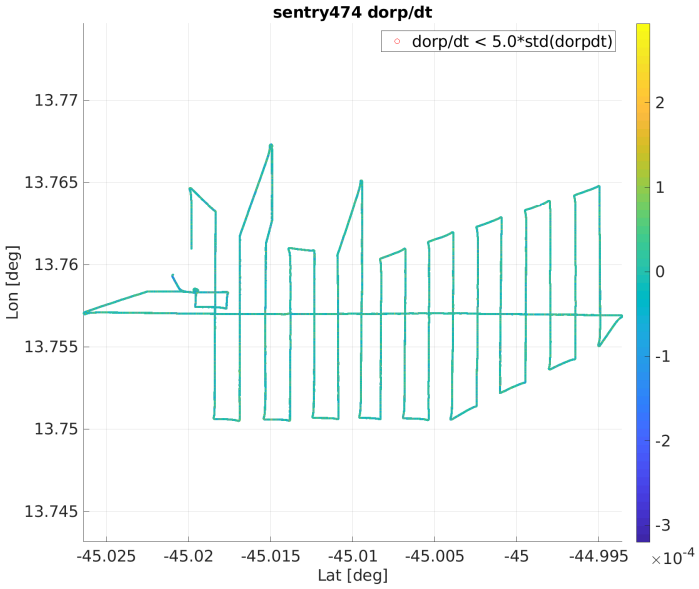


Figure 17: Navigated ORP sensor data.

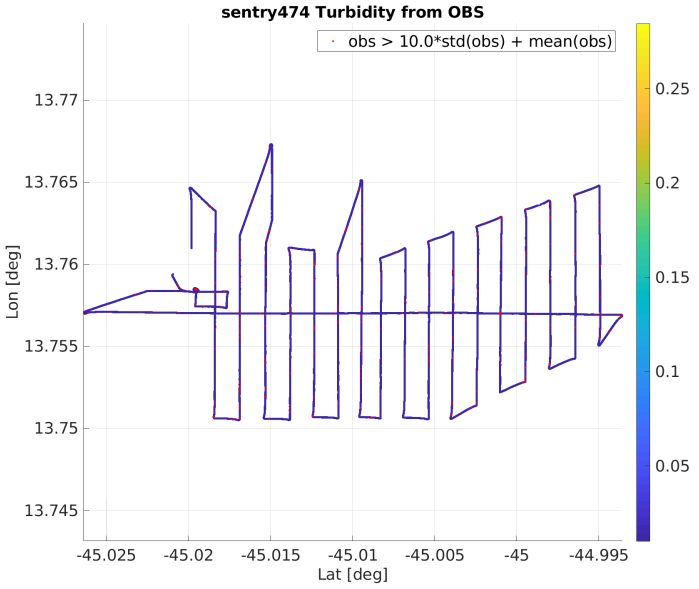


Figure 18: Navigated OBS sensor data.

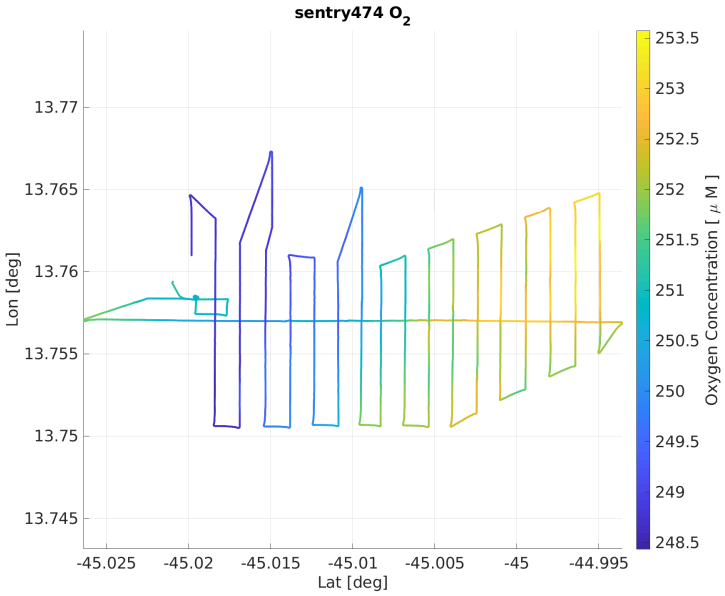


Figure 19: Navigated optode sensor data.

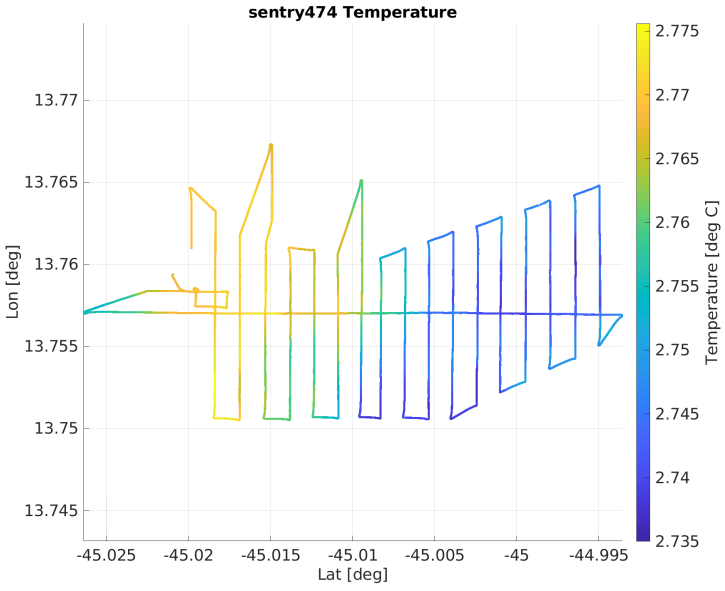


Figure 20: Navigated temperature sensor data

Sentry 475 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 17 to 20 knots, seas 4 to 6 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry475 launch position: 13 44.850'N 045 1.023'W

Narrative

Sentry475 was the third dive of the cruise. This survey continued the survey south of the 2016 multibeam adding to the multibeam from sentry474 in area10. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3800m. Overall this dive went very well, capturing all of the intended survey area. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Continued testing of the waveglider was completed during this dive. The objective for this dive was to instruct the waveglider to 'follow' Sentry as it moved along its planned survey. This following capability of the waveglider worked very well. During the dive, the waveglider followed Sentry with an offset to keep the waveglider from interfering with the ship. This offset was roughly 5km.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.5 sentry475 Summary

sentry475 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/19 20:33:14
Survey start: 2018/05/19 22:12:13
Survey start: Lat:13.745385 Lon:-45.017238
Survey start: Lat:13 44.723'N Lon:045 1.034'W
Survey end: 2018/05/20 07:12:38
Survey end: Lat:13.767624 Lon:-45.021086
Survey end: Lat:13 46.057'N Lon:045 1.265'W
Ascent begins: 2018/05/20 07:12:38
On the surface: 2018/05/20 08:25:06
On deck: 2018/05/20 08:36:12
descent rate: 38.3 m/min
ascent rate: 52.3 m/min
survey time: 9.0 hours
deck-to-deck time 12.0 hours
Min survey depth: 3478m
Max survey depth: 3865m
Mean survey depth: 3663m
Mean survey height: 80m
distance travelled: 30.91km
average speed: 0.93m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.93 m/s over 30.91 km
total vertical during survey: 6605m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.4 kwhr
Battery energy on surface: 11.2 kwhr
Battery energy on deck: 11.1 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry475/nav-sci/proc directory within the sentry475_config matlab structure as well as in ascii text logs in sentry475/metadata. At present metadata is not yet automatically collected on all sensors.

0.6 sentry475 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180519_1837.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180519_1837.cfg`
CTD	SBE 49	260		`sbe49_20180519_1838.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180519_1837.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

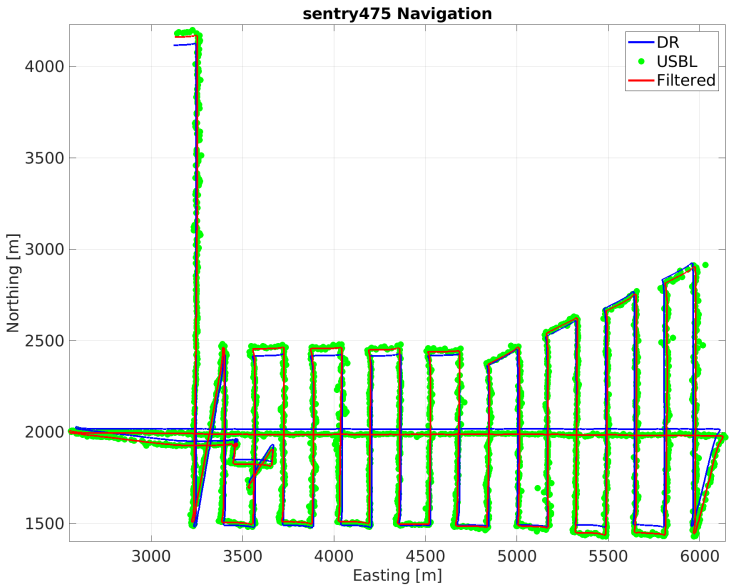


Figure 21: Latitude/Longitude plot of Sentry dive 475 based on post-processed navigation

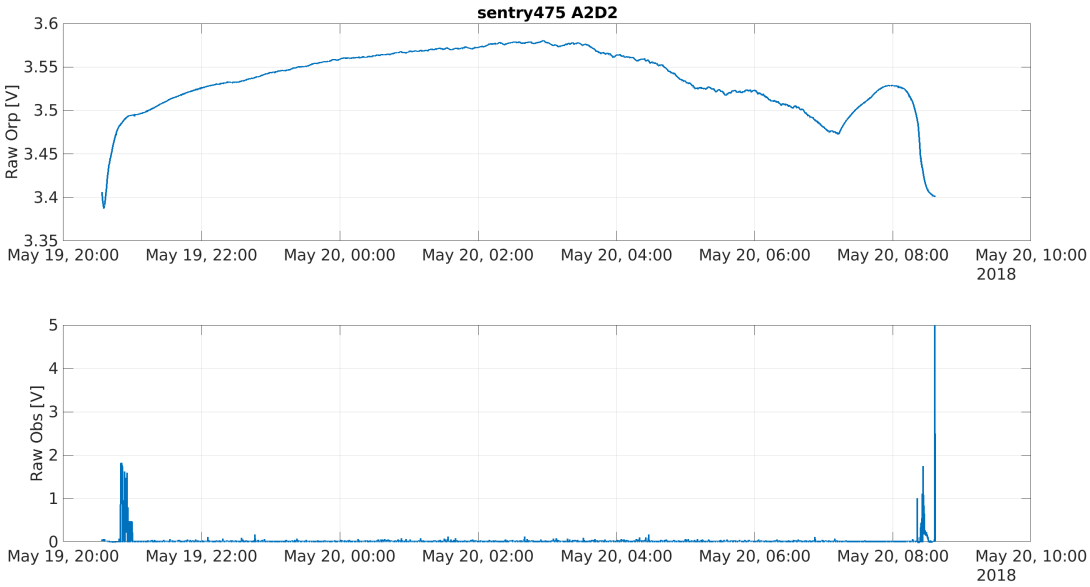


Figure 22: Raw analog Sensor Data

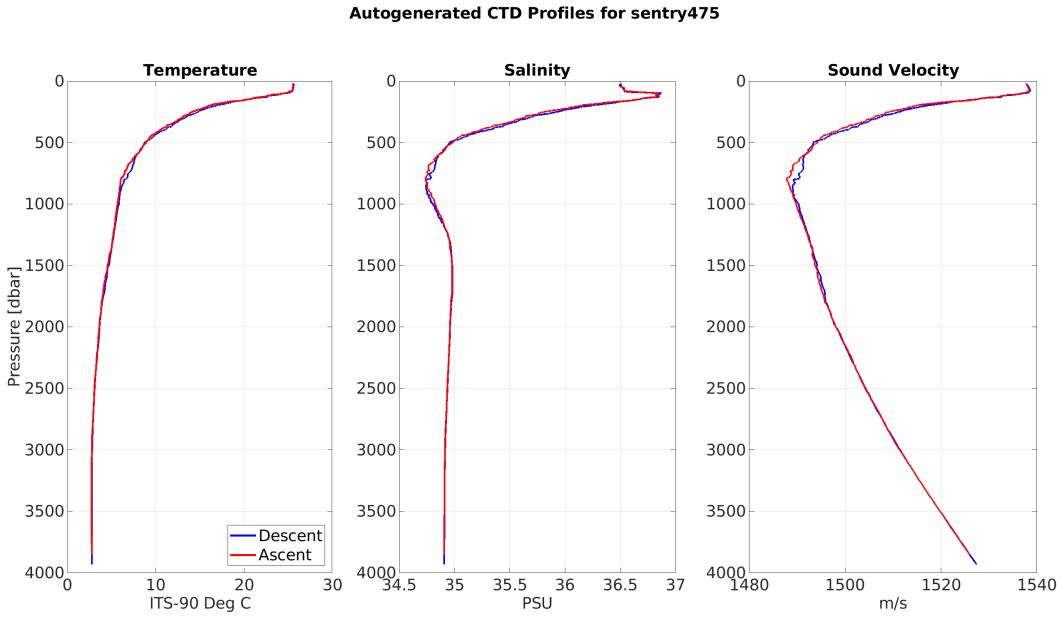


Figure 23: CTD profile sensor data

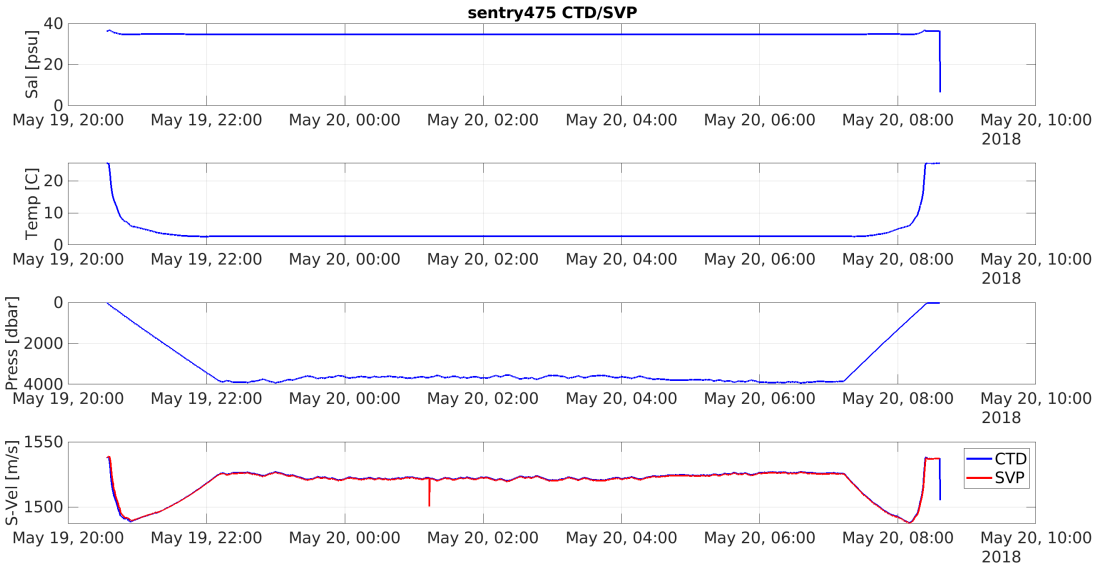


Figure 24: CTD and SVP sensor data

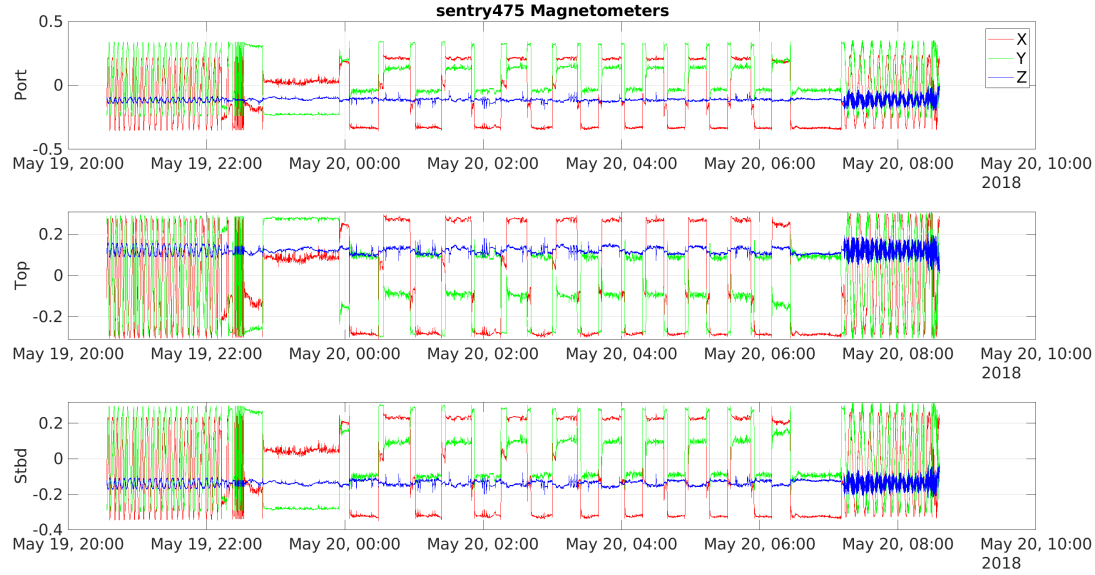


Figure 25: Magnetometer data from each of the three magnetometers on Sentry

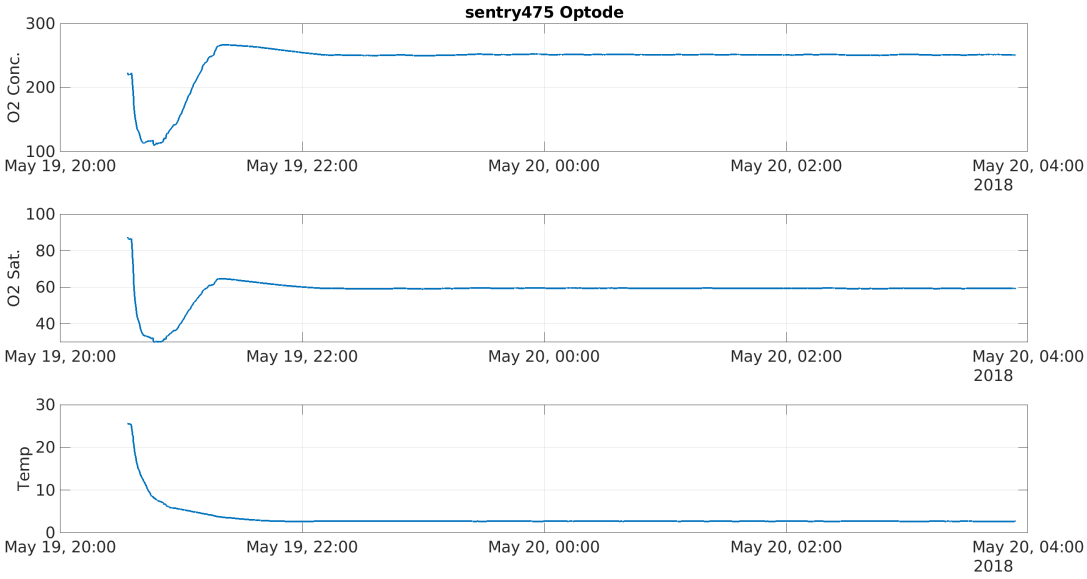


Figure 26: Optode temperature, O2 saturation, and concentration

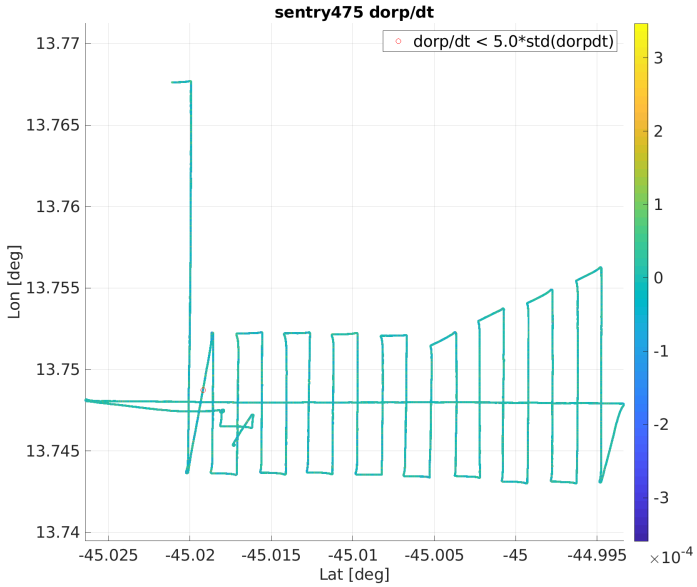


Figure 27: Navigated ORP sensor data.

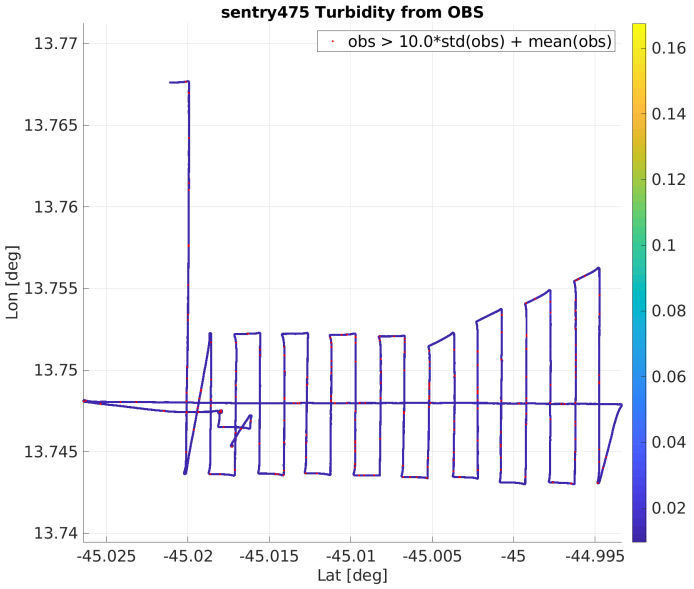


Figure 28: Navigated OBS sensor data.

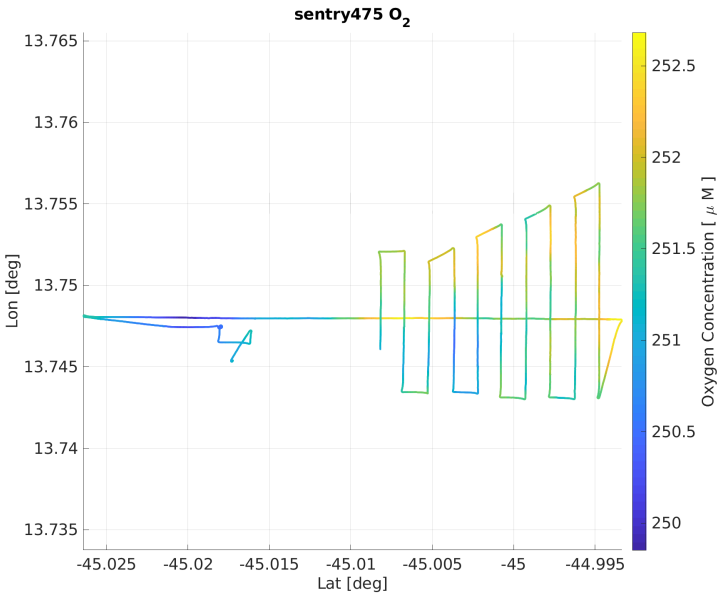


Figure 29: Navigated optode sensor data.

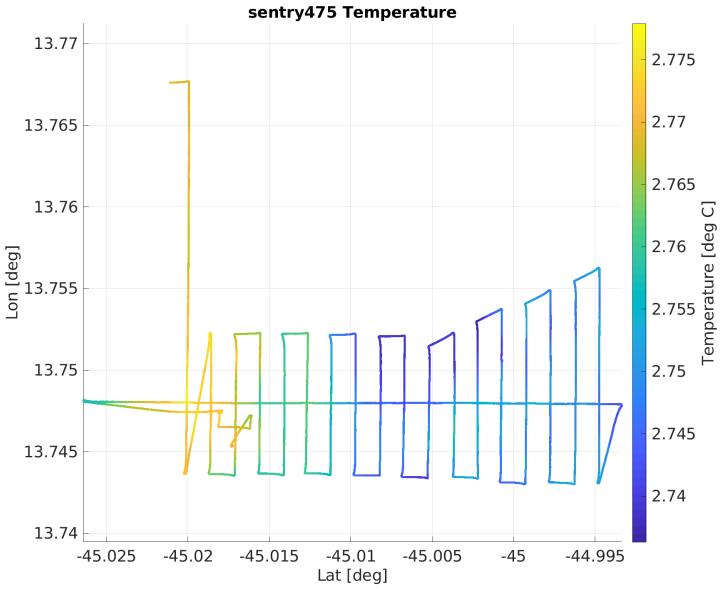
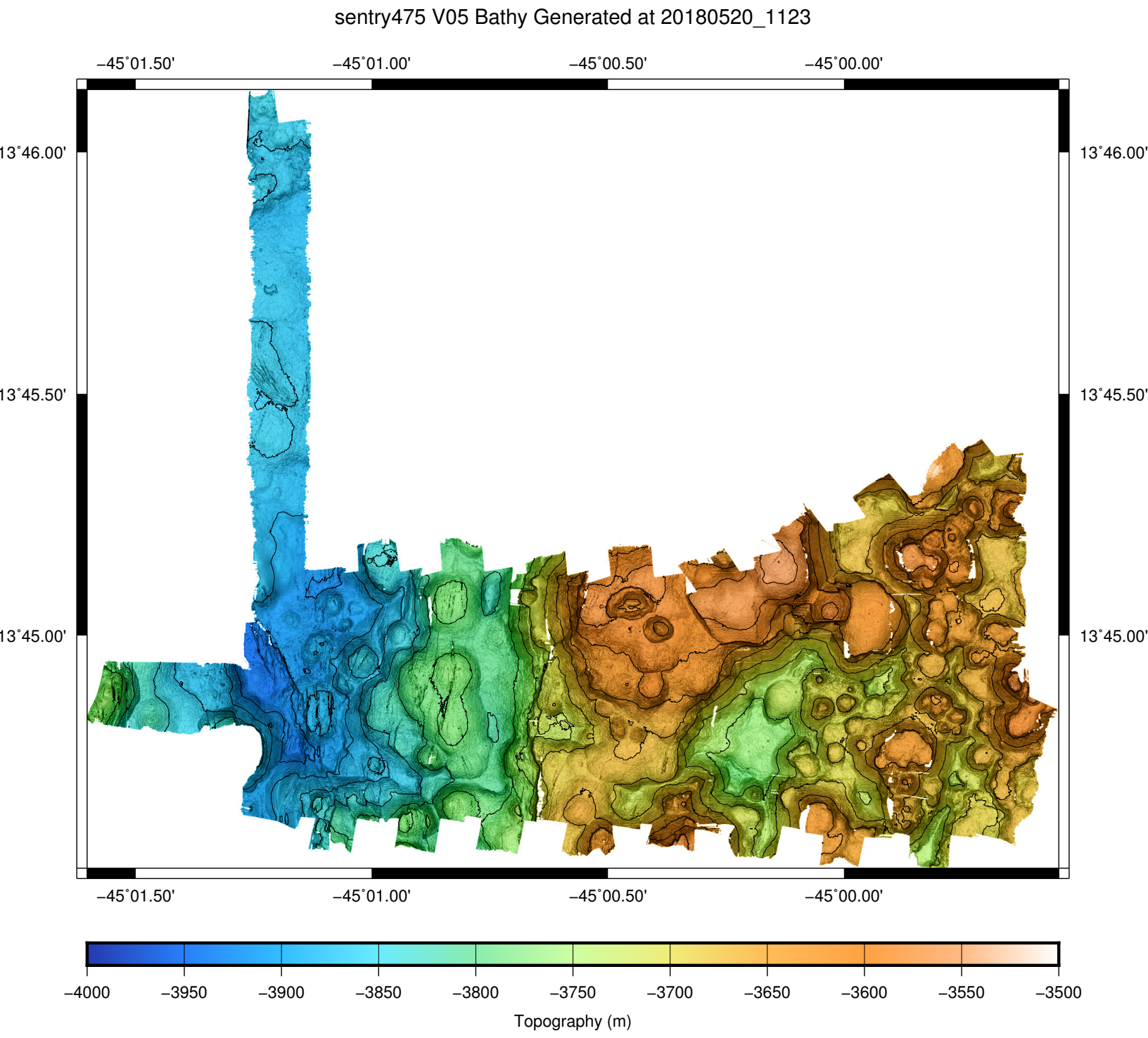


Figure 30: Navigated temperature sensor data


sentry475 V05 Bathy Generated at 20180520_1123
−45˚01.50'
−45˚01.00'
−45˚00.50'
−45˚00.00'
13˚46.00'
13˚45.50'
13˚45.00'
−4000
−3950
−3900
−3850
−3800
−3750
−3700
−3650
−3600
−3550
−3500
Topography (m)

Sentry 476 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 17 to 20 knots, seas 5 to 9 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry476 launch position: 13 49.013'N 044 59.050'W

Narrative

Sentry476 was the fourth dive of the cruise. This dive covered an area on the core complex west of sentry374 from the 2016 survey. In total, this dive covered 2.2km west of the existing high resolution bathy.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3400m. Overall this dive went very well, capturing most of the intended survey area. Sentry was manually aborted to ensure an on time arrival for Alvin operations back on popping rocks ridge.

Waveglider testing continued throughout this dive. The waveglider followed Sentry as it progressed through its mission from the surface. Atlantis maintained a standoff distance of roughly 1km throughout the dive. An hour before recover, the wave glider was commanded to move 2km north in order to allow the Atlantis room for recovery.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.7 sentry476 Summary

sentry476 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/20 20:31:39
Survey start: 2018/05/20 22:02:01
Survey start: Lat:13.815332 Lon:-44.984584
Survey start: Lat:13 48.920'N Lon:044 59.075'W
Survey end: 2018/05/21 07:00:48
Survey end: Lat:13.812193 Lon:-44.985294
Survey end: Lat:13 48.732'N Lon:044 59.118'W
Ascent begins: 2018/05/21 07:00:48
On the surface: 2018/05/21 08:05:21
On deck: 2018/05/21 08:18:52
descent rate: 37.8 m/min
ascent rate: 52.3 m/min
survey time: 9.0 hours
deck-to-deck time 11.8 hours
Min survey depth: 3062m
Max survey depth: 3524m
Mean survey depth: 3323m
Mean survey height: 79m
distance travelled: 31.46km
average speed: 0.96m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.96 m/s over 31.46 km
total vertical during survey: 6751m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.2 kwhr
Battery energy on surface: 11.1 kwhr
Battery energy on deck: 11.0 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry476/nav-sci/proc directory within the sentry476_config matlab structure as well as in ascii text logs in sentry476/metadata. At present metadata is not yet automatically collected on all sensors.

0.8 sentry476 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180520_1758.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180520_1758.cfg`
CTD	SBE 49	260		`sbe49_20180520_1759.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180520_1758.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

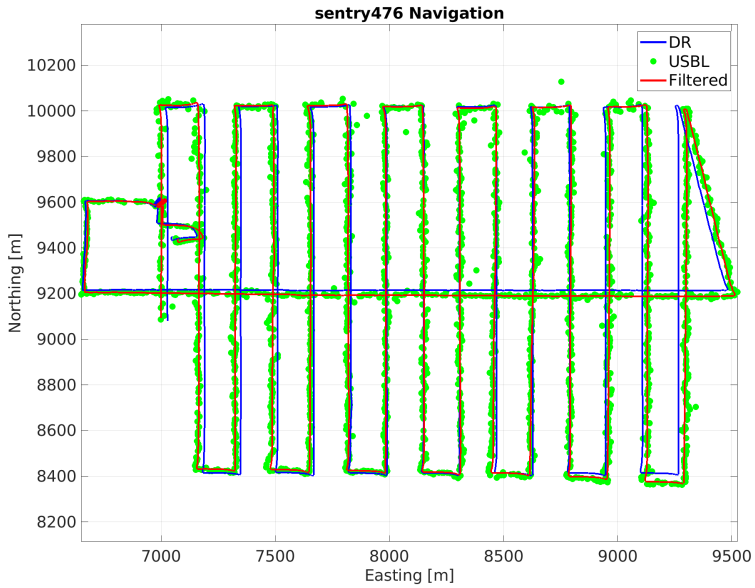


Figure 31: Latitude/Longitude plot of Sentry dive 476 based on post-processed navigation

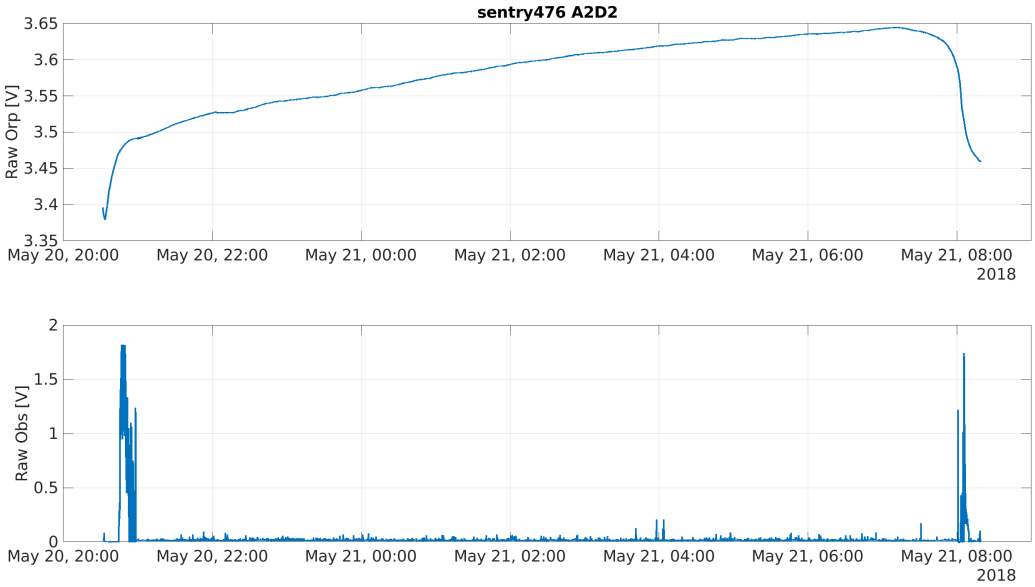


Figure 32: Raw analog Sensor Data

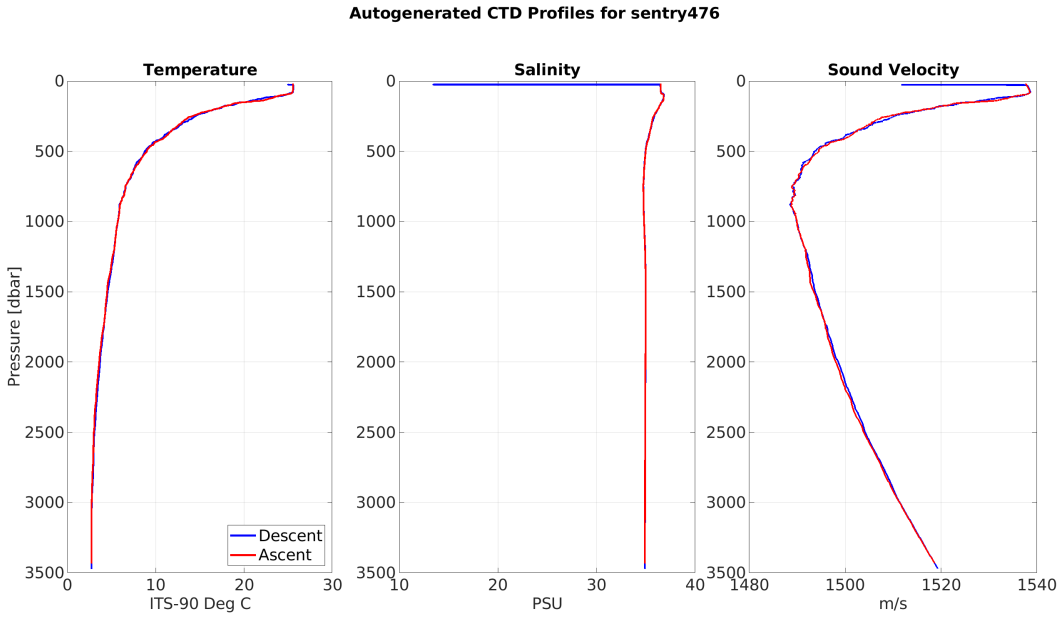


Figure 33: CTD profile sensor data

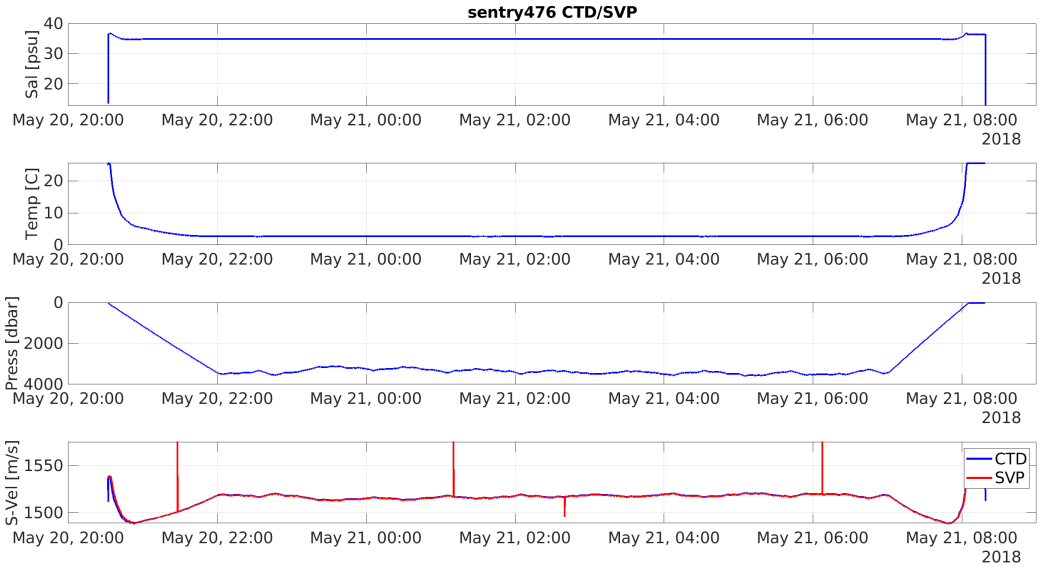


Figure 34: CTD and SVP sensor data

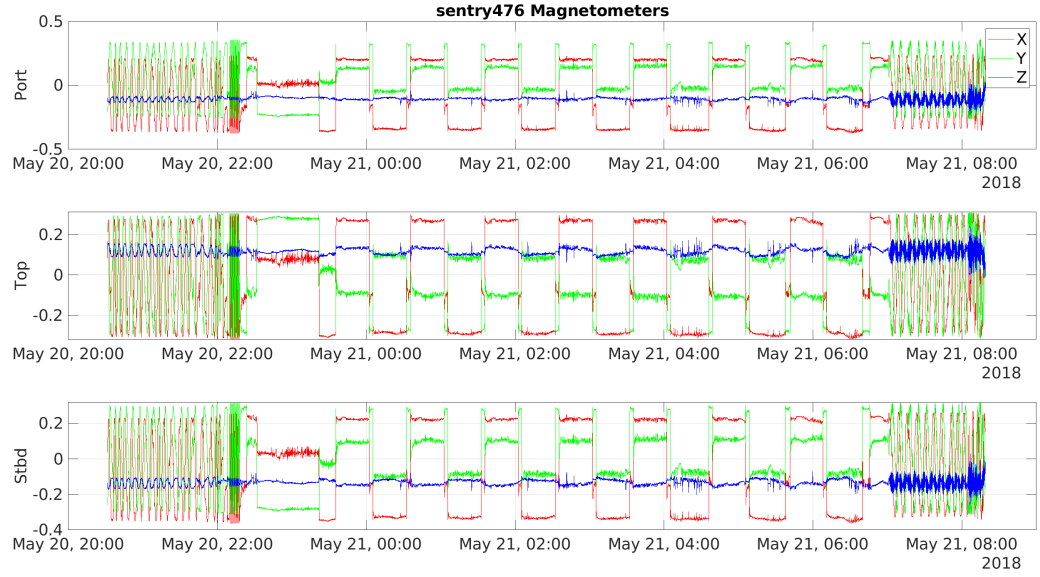


Figure 35: Magnetometer data from each of the three magnetometers on Sentry

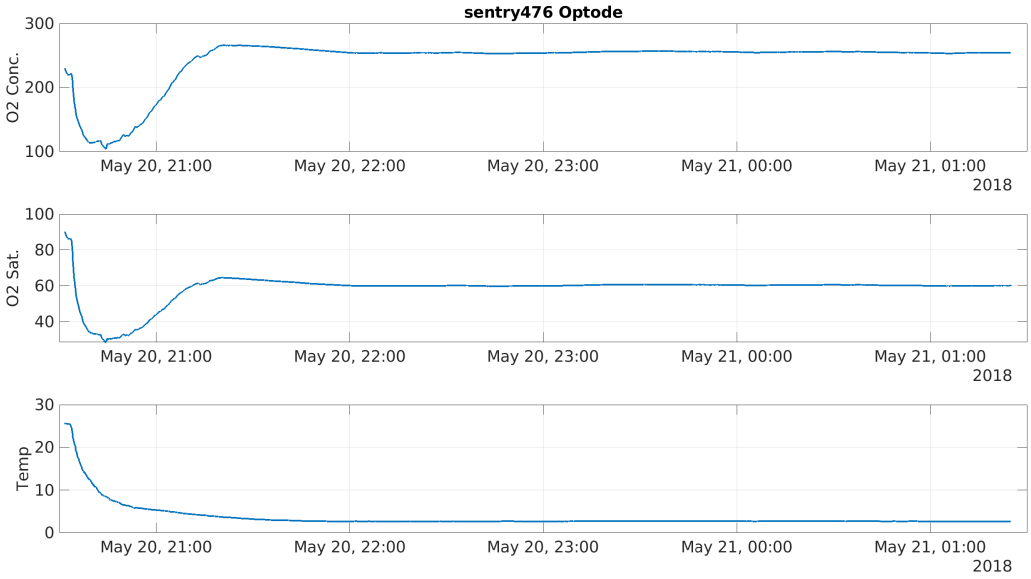


Figure 36: Optode temperature, O2 saturation, and concentration

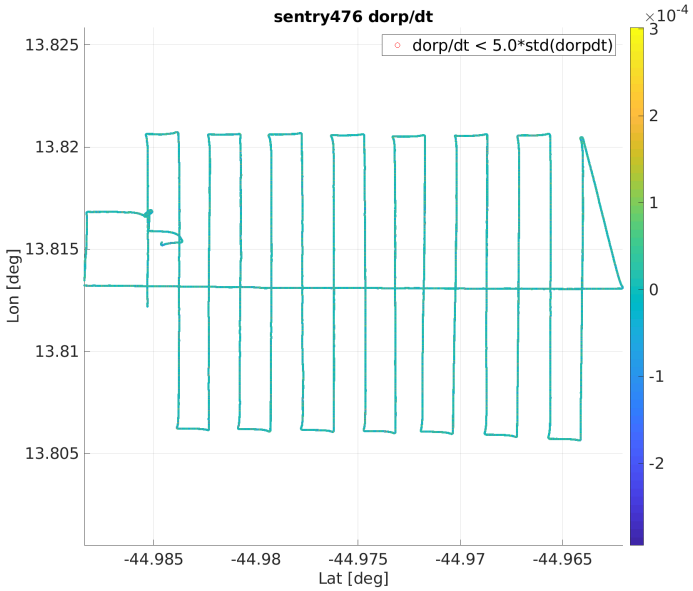


Figure 37: Navigated ORP sensor data.

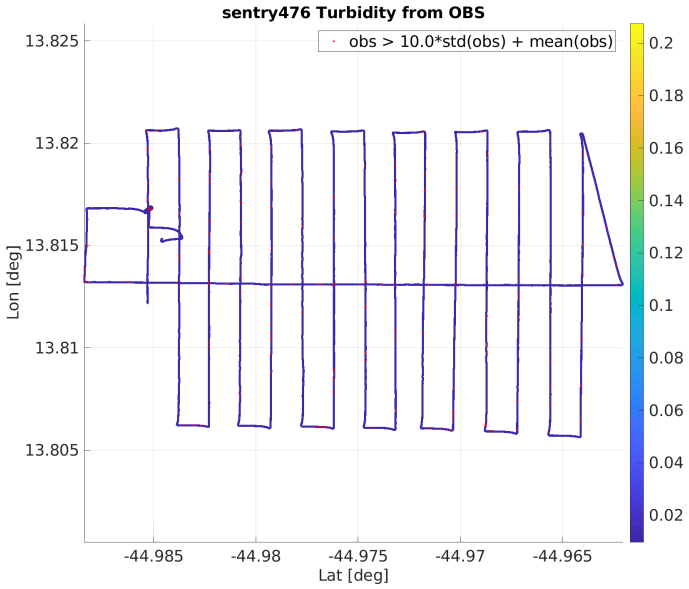


Figure 38: Navigated OBS sensor data.

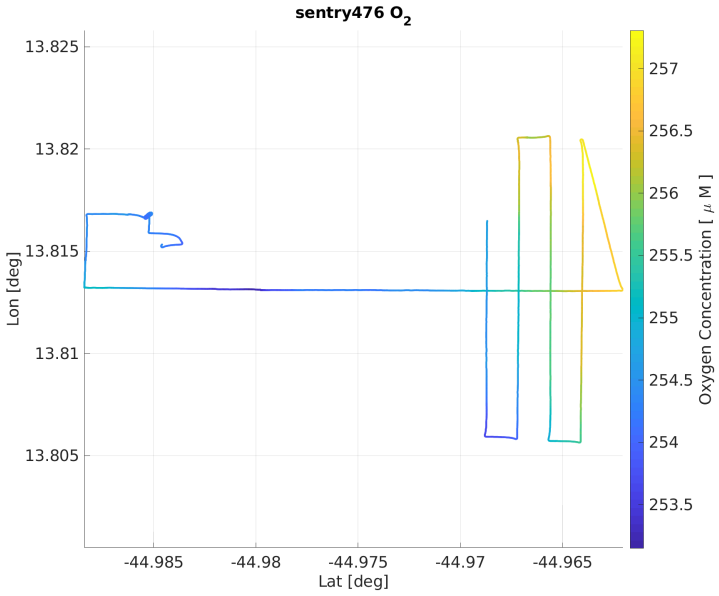


Figure 39: Navigated optode sensor data.

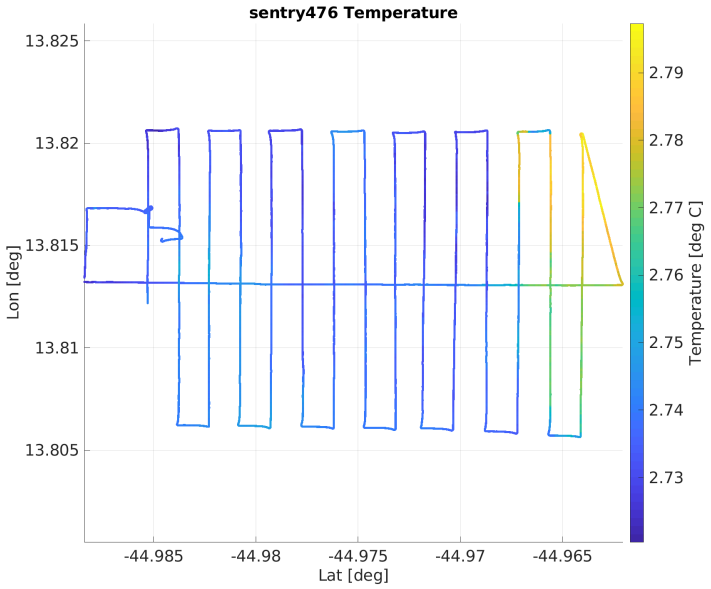
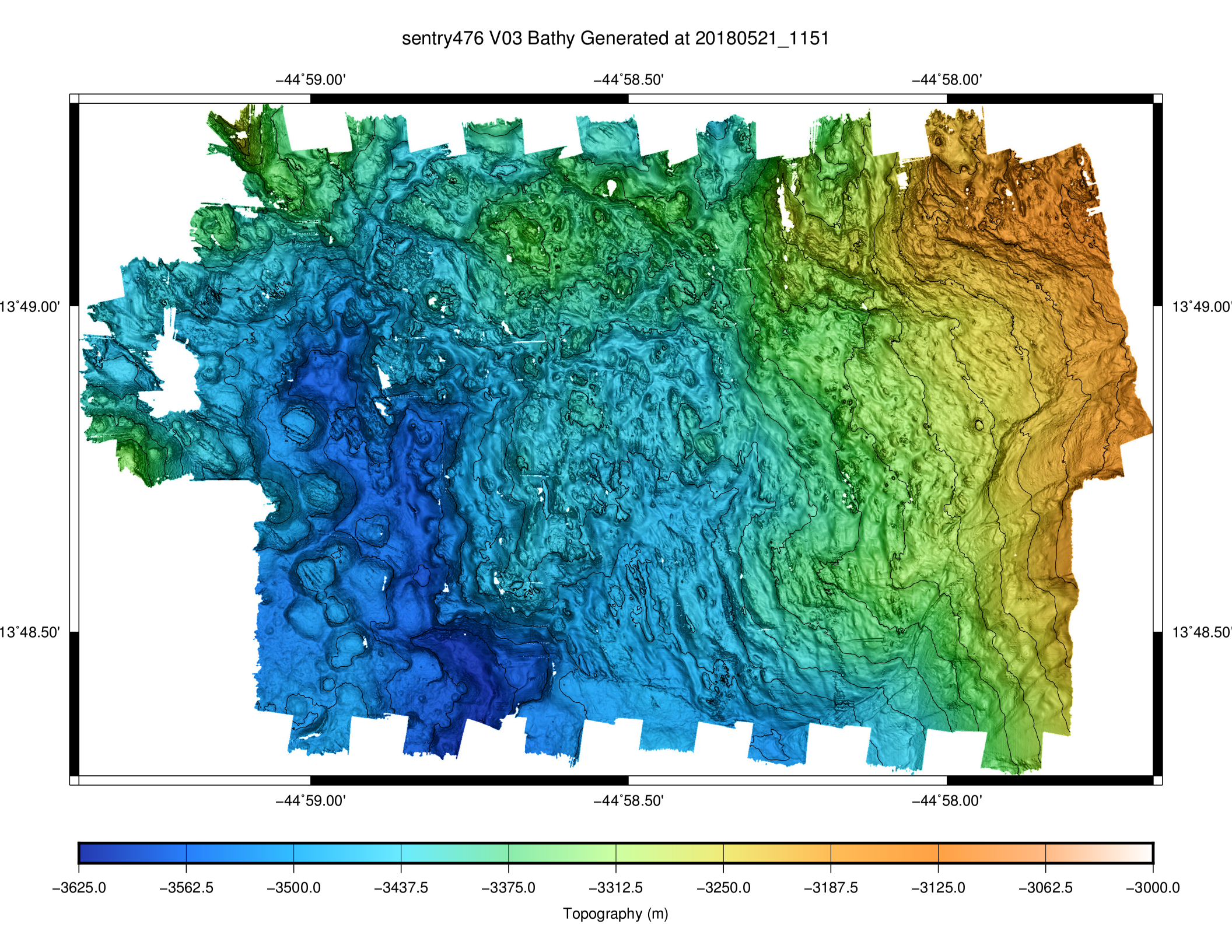


Figure 40: Navigated temperature sensor data


sentry476 V03 Bathy Generated at 20180521_1151
−44°59.00'
−44°58.50'
−44°58.00'
13°49.00'
13°48.50'
−3625.0
−3562.5
−3500.0
−3437.5
−3375.0
−3312.5
−3250.0
−3187.5
−3125.0
−3062.5
−3000.0
Topography (m)

Sentry 477 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 17 to 20 knots, seas 5 to 7 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 42.0 -45 -4

Launch Position: sentry477 launch position: 13 44.405'N 045 0.900'W

Narrative

Sentry477 was the fifth dive of the cruise and the fourth dive on popping rocks ridge in area1. This dive continuing covering area1 to the south with roughly 2.5km by 1.2km area in total covered.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3800m. Overall this dive went very well, capturing most of the intended survey area. Once the crossing line and first line of the survey were complete, Atlantis left the work site in order to dump food slops. This took roughly two hours to complete. The end of the survey included a target of interest for Sentry to survey based on an ORP fix from Sentry465. Sentry drove in a loop around this fix at roughly 30m altitude. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Waveglider operations aided in the ships ability to leave station by providing continued updates through the ships time away from station. The waveglider was commanded to follow Sentry throughout the mission tracklines and had no issues and performed well.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.9 sentry477 Summary

sentry477 Summary
Origin: 13.700000 -45.066667
Origin: 13 42.000'N 045 4.000'W
Launch: 2018/05/21 20:33:15
Survey start: 2018/05/21 22:11:03
Survey start: Lat:13.738692 Lon:-45.014578
Survey start: Lat:13 44.321'N Lon:045 0.875'W
Survey end: 2018/05/22 07:16:02
Survey end: Lat:13.737532 Lon:-45.018917
Survey end: Lat:13 44.252'N Lon:045 1.135'W
Ascent begins: 2018/05/22 07:16:02
On the surface: 2018/05/22 08:29:26
On deck: 2018/05/22 08:43:47
descent rate: 38.1 m/min
ascent rate: 52.2 m/min
survey time: 9.1 hours
deck-to-deck time 12.2 hours
Min survey depth: 3506m
Max survey depth: 3900m
Mean survey depth: 3693m
Mean survey height: 82m
distance travelled: 29.74km
average speed: 0.90m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.90 m/s over 29.74 km
total vertical during survey: 7566m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.0 kwhr
Battery energy at survey end: 11.2 kwhr
Battery energy on surface: 11.0 kwhr
Battery energy on deck: 10.9 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry477/nav-sci/proc directory within the sentry477_config matlab structure as well as in ascii text logs in sentry477/metadata. At present metadata is not yet automatically collected on all sensors.

0.10 sentry477 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180521_1804.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180521_1805.cfg`
CTD	SBE 49	260		`sbe49_20180521_1805.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180521_1804.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

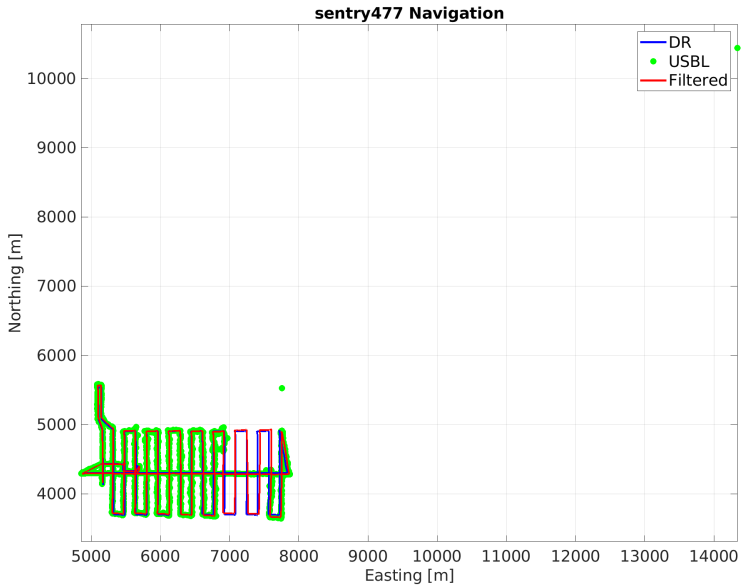


Figure 41: Latitude/Longitude plot of Sentry dive 477 based on post-processed navigation

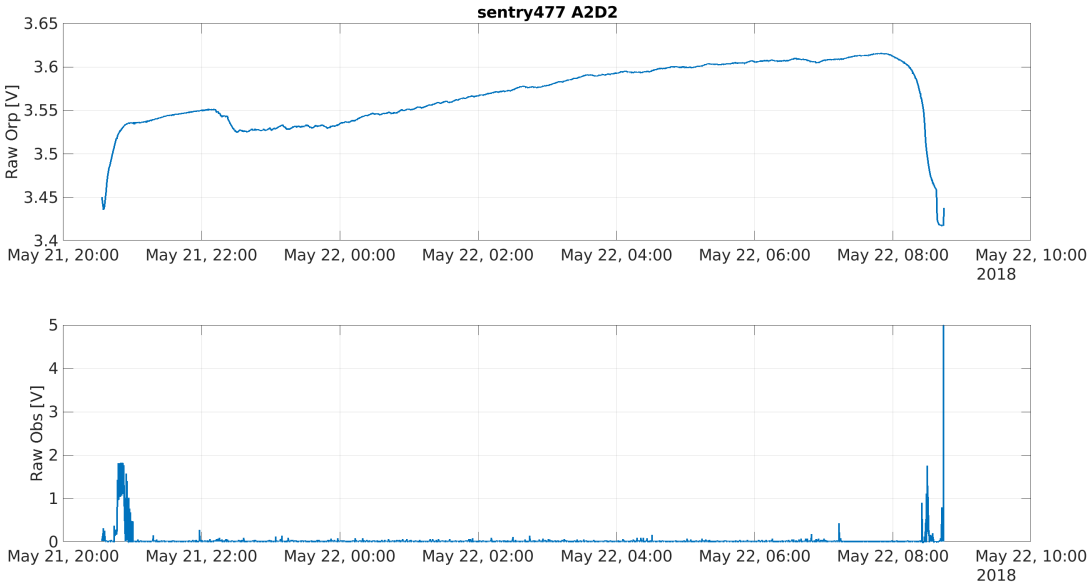


Figure 42: Raw analog Sensor Data

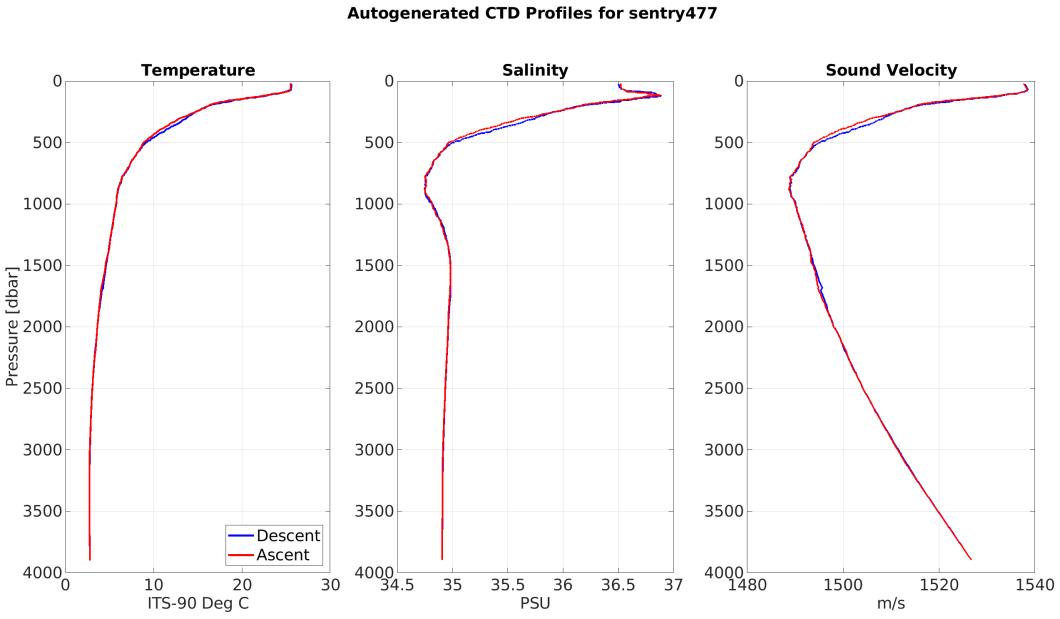


Figure 43: CTD profile sensor data

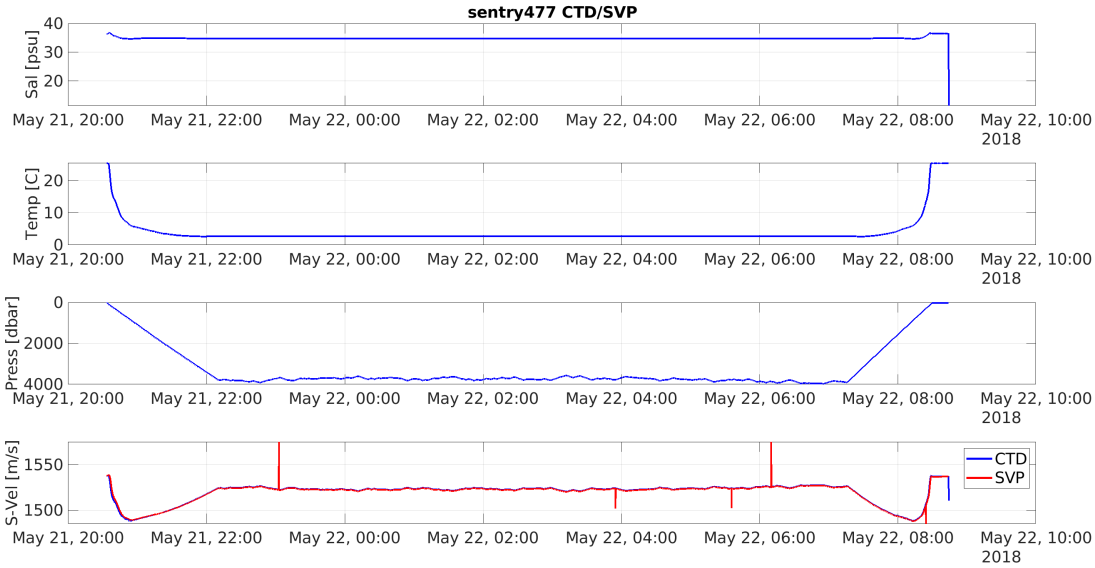


Figure 44: CTD and SVP sensor data

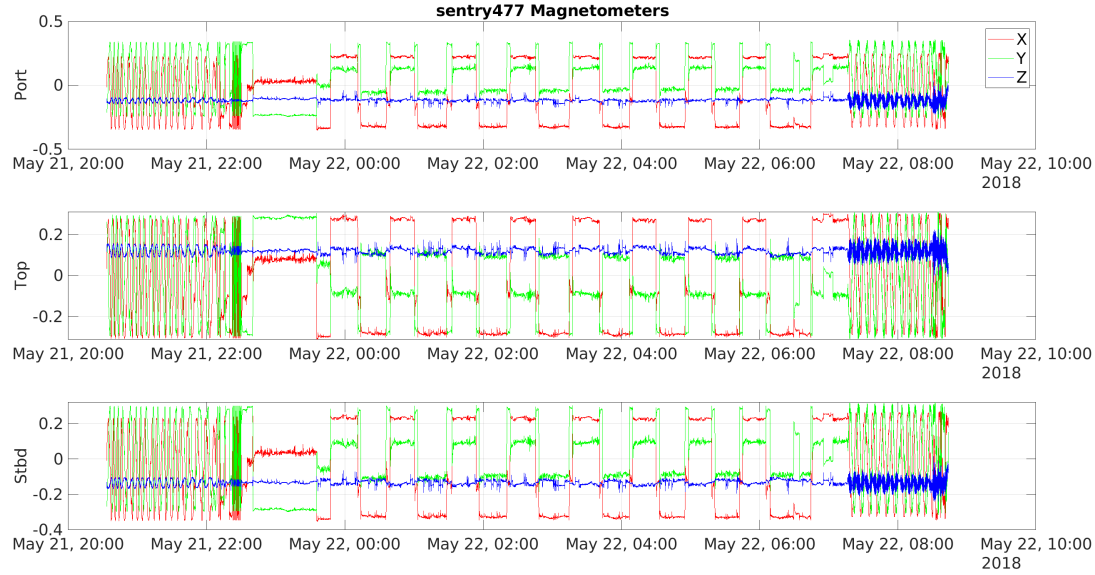


Figure 45: Magnetometer data from each of the three magnetometers on Sentry

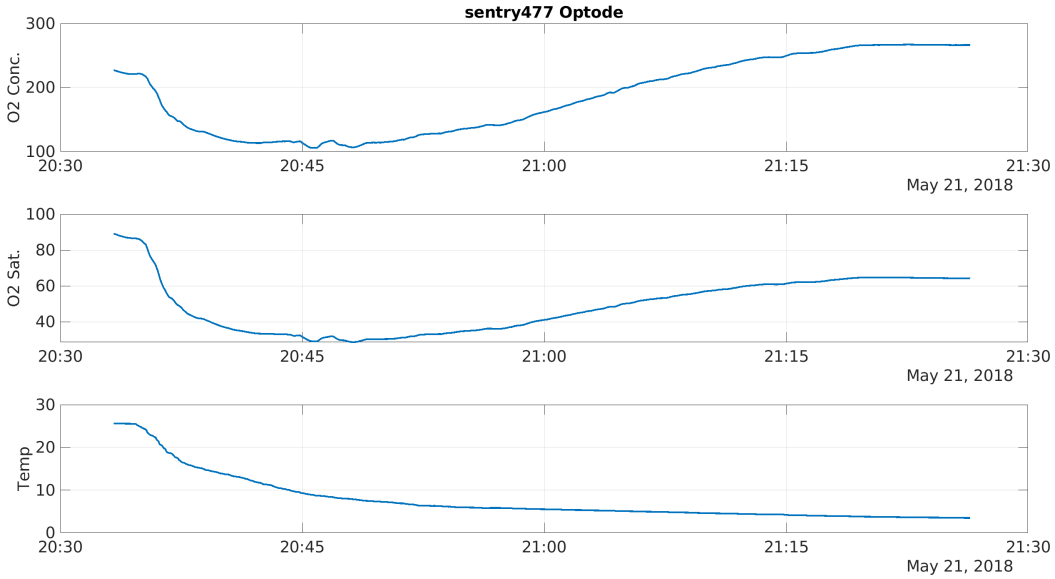


Figure 46: Optode temperature, O2 saturation, and concentration

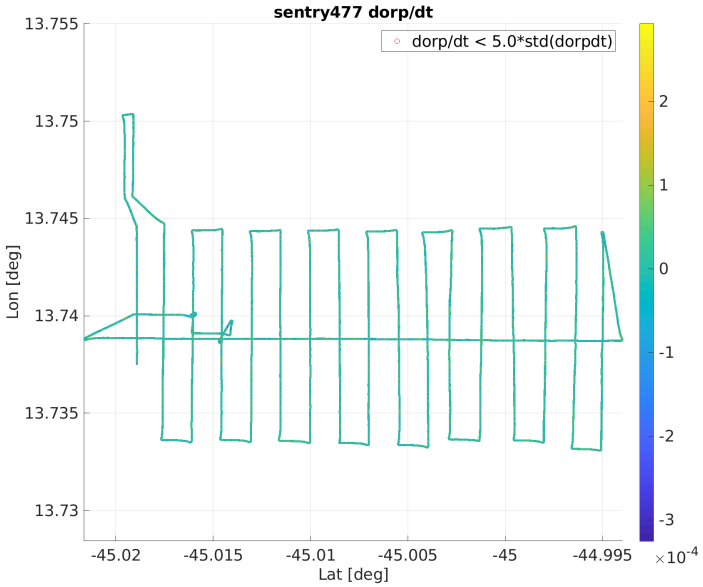


Figure 47: Navigated ORP sensor data.

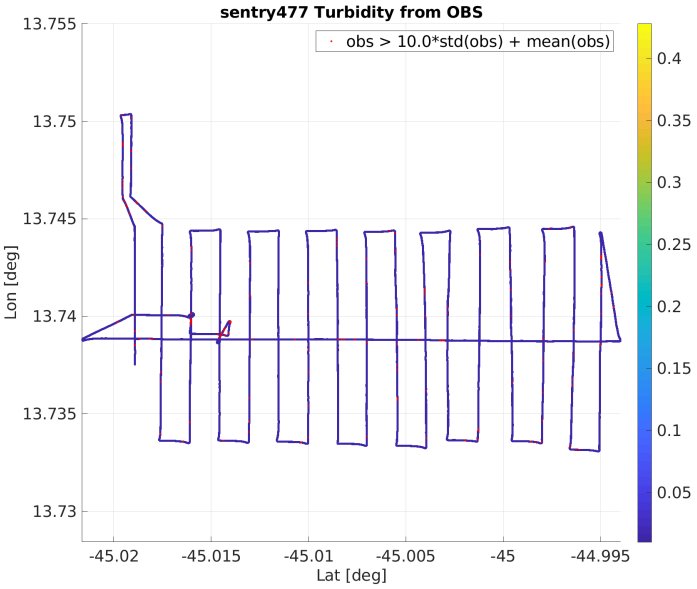


Figure 48: Navigated OBS sensor data.

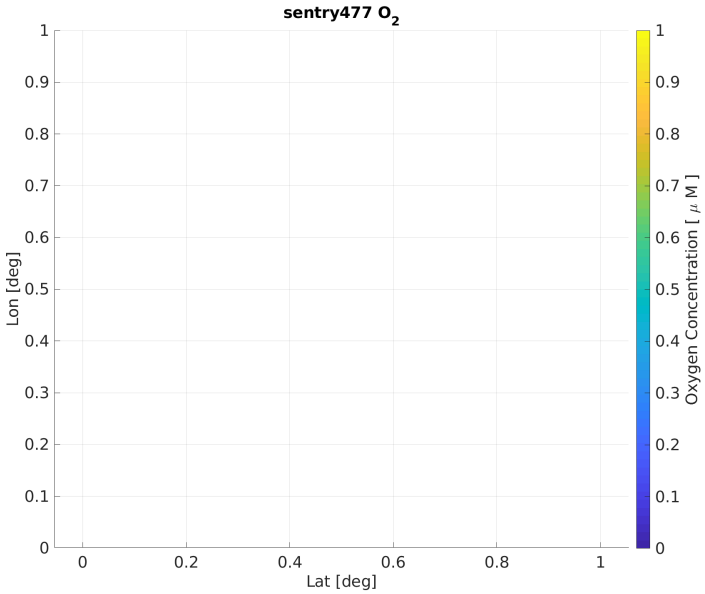


Figure 49: Navigated optode sensor data.

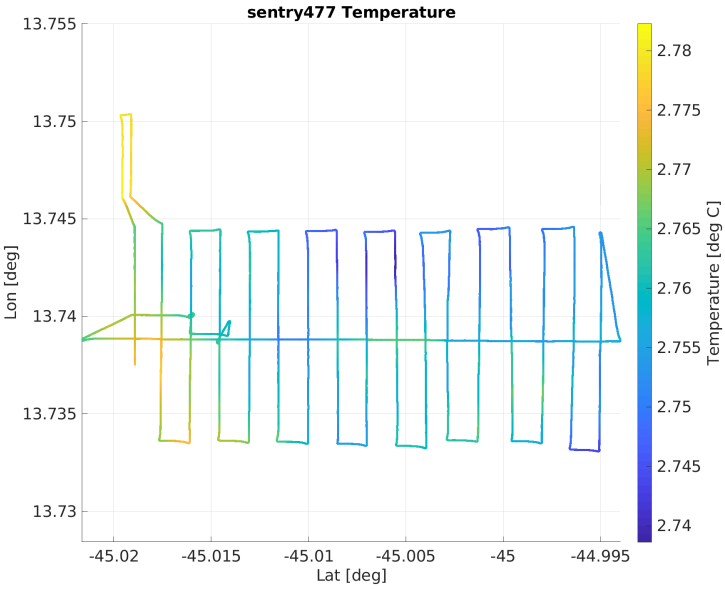
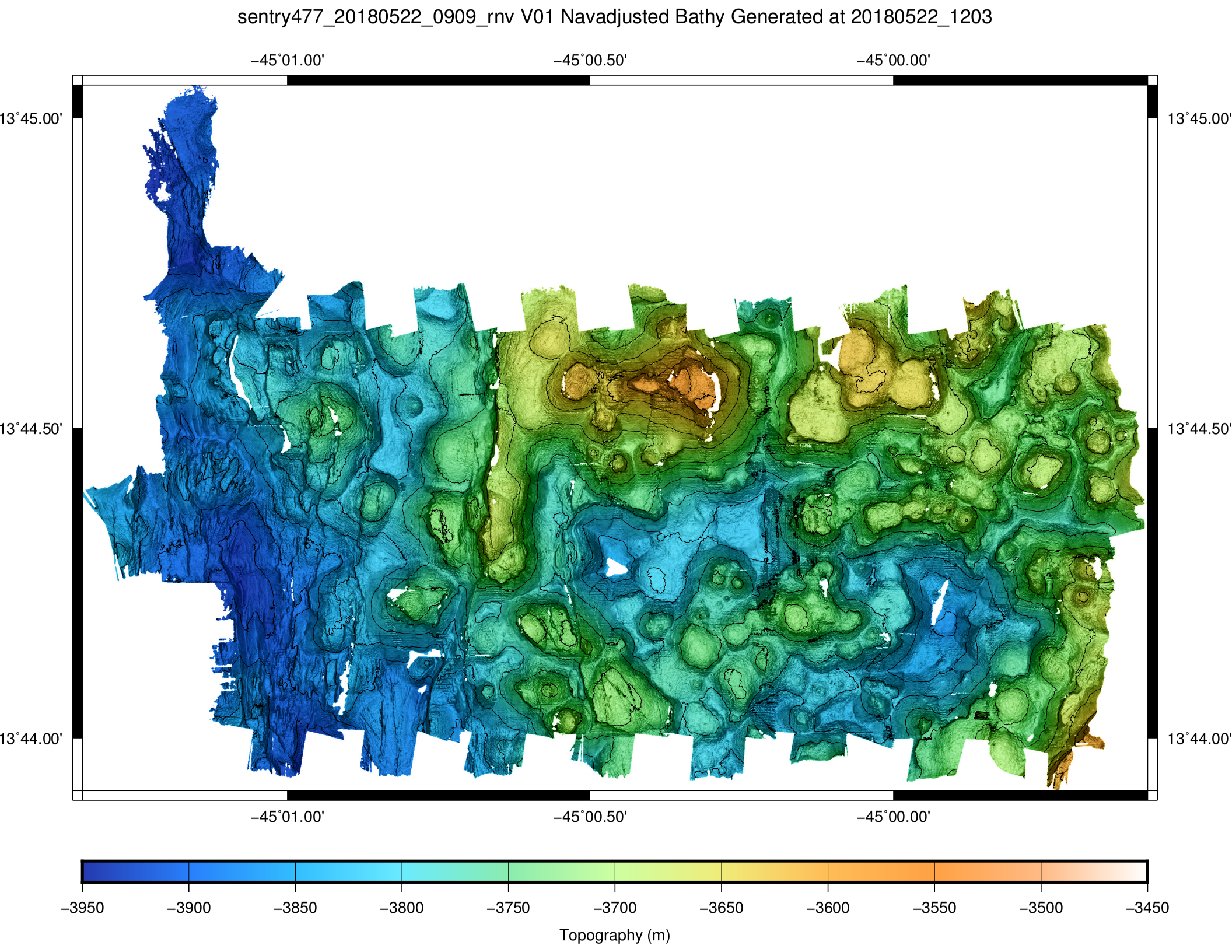


Figure 50: Navigated temperature sensor data


sentry477_20180522_0909_rnv V01 Navadjusted Bathy Generated at 20180522_1203
−45˚01.00'
−45˚00.50'
−45˚00.00'
13˚45.00'
13˚44.50'
13˚44.00'
−3950
−3900
−3850
−3800
−3750
−3700
−3650
−3600
−3550
−3500
−3450
Topography (m)

Sentry 478 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 15 to 18 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 42.0 -45 -4

Launch Position: sentry478 launch position: 13 43.801'N 045 1.400'W

Narrative

Sentry478 was the sixth dive of the cruise and the fifth dive on popping rocks ridge area1. This dive covered an area continuing the popping rocks ridge bathy to the south. Covering roughly 2.5km by 1.2km area.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3800m. Overall this dive went very well, capturing most of the intended survey area. This survey also included tie lines into the previous dive map that would help aid in navigation tie of the multibeam. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. This took roughly five hours to complete returning to the Sentry survey at 03:00 local. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Waveglider operations aided in the ships ability to leave station by providing continued updates while the vessel was away from station. The waveglider was commanded to follow Sentry throughout the mission tracklines and had no issues and performed well.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.11 sentry478 Summary

sentry478 Summary
Origin: 13.700000 -45.066667
Origin: 13 42.000'N 045 4.000'W
Launch: 2018/05/22 20:39:23
Survey start: 2018/05/22 22:13:58
Survey start: Lat:13.729589 Lon:-45.023262
Survey start: Lat:13 43.775'N Lon:045 1.396'W
Survey end: 2018/05/23 07:00:38
Survey end: Lat:13.731393 Lon:-45.016301
Survey end: Lat:13 43.884'N Lon:045 0.978'W
Ascent begins: 2018/05/23 07:00:38
On the surface: 2018/05/23 08:13:19
On deck: 2018/05/23 08:26:09
descent rate: 38.3 m/min
ascent rate: 52.7 m/min
survey time: 8.8 hours
deck-to-deck time 11.8 hours
Min survey depth: 3499m
Max survey depth: 3879m
Mean survey depth: 3693m
Mean survey height: 83m
distance travelled: 30.11km
average speed: 0.94m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.94 m/s over 30.11 km
total vertical during survey: 7088m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.4 kwhr
Battery energy on surface: 11.3 kwhr
Battery energy on deck: 11.2 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry478/nav-sci/proc directory within the sentry478_config matlab structure as well as in ascii text logs in sentry478/metadata. At present metadata is not yet automatically collected on all sensors.

0.12 sentry478 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180522_1754.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180522_1755.cfg`
CTD	SBE 49	260		`sbe49_20180522_1755.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180522_1755.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

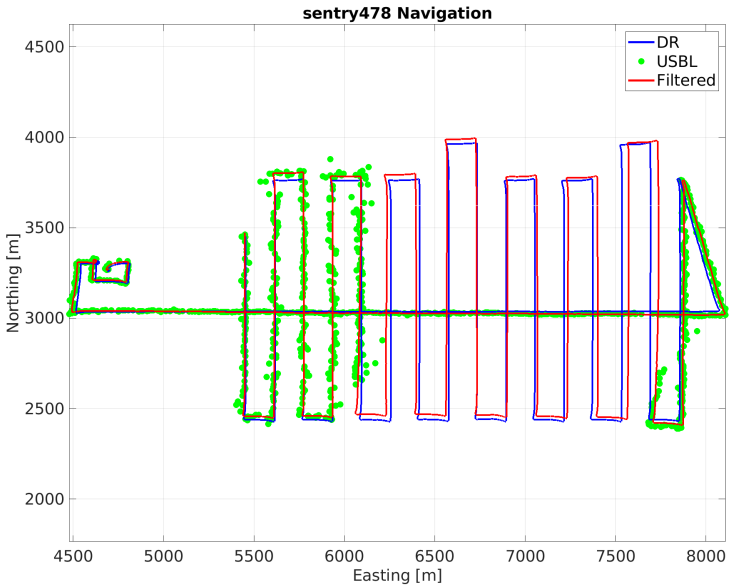


Figure 51: Latitude/Longitude plot of Sentry dive 478 based on post-processed navigation

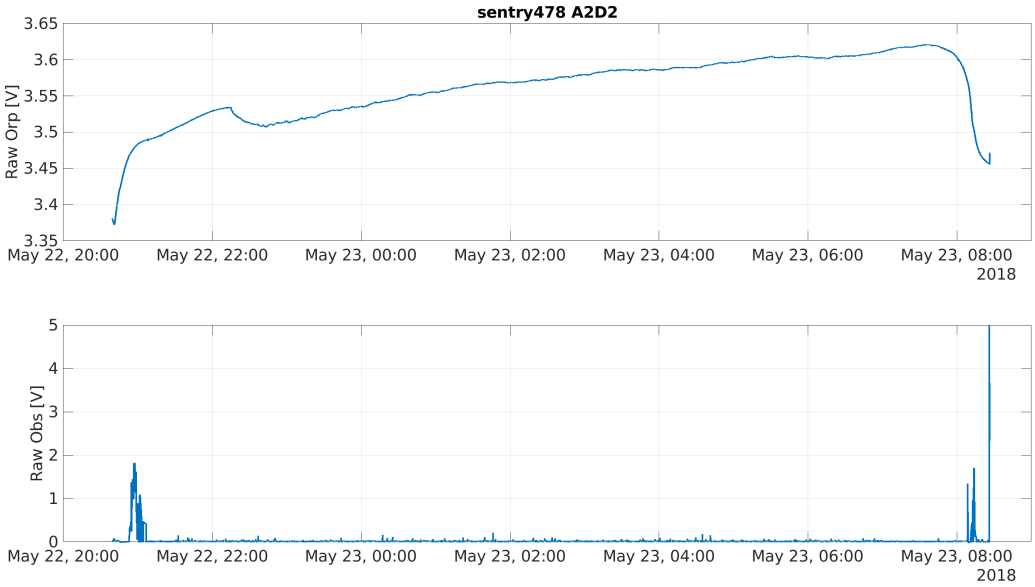


Figure 52: Raw analog Sensor Data

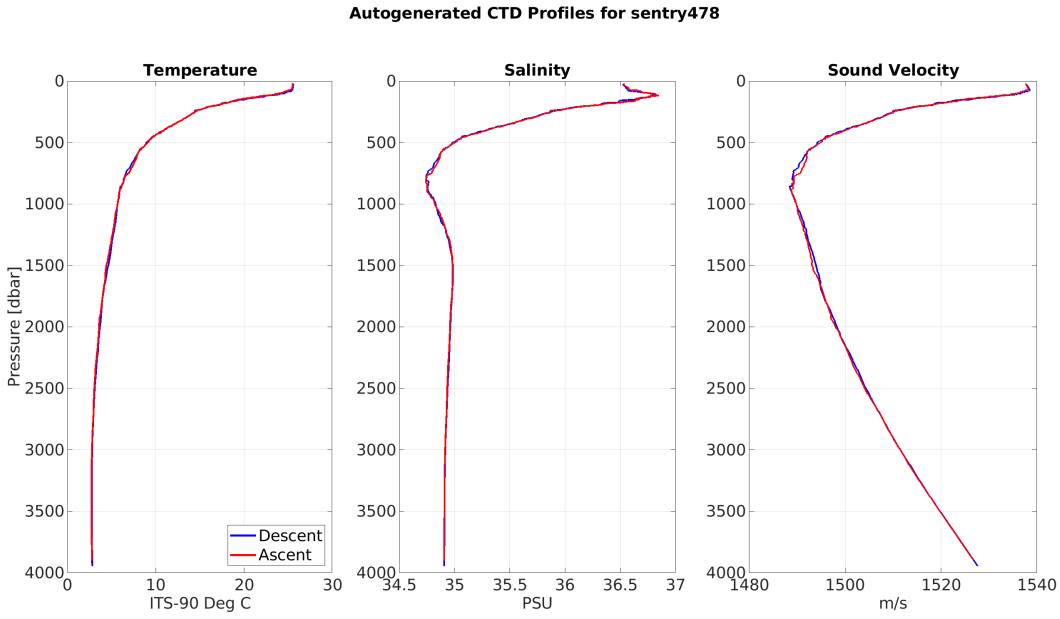


Figure 53: CTD profile sensor data

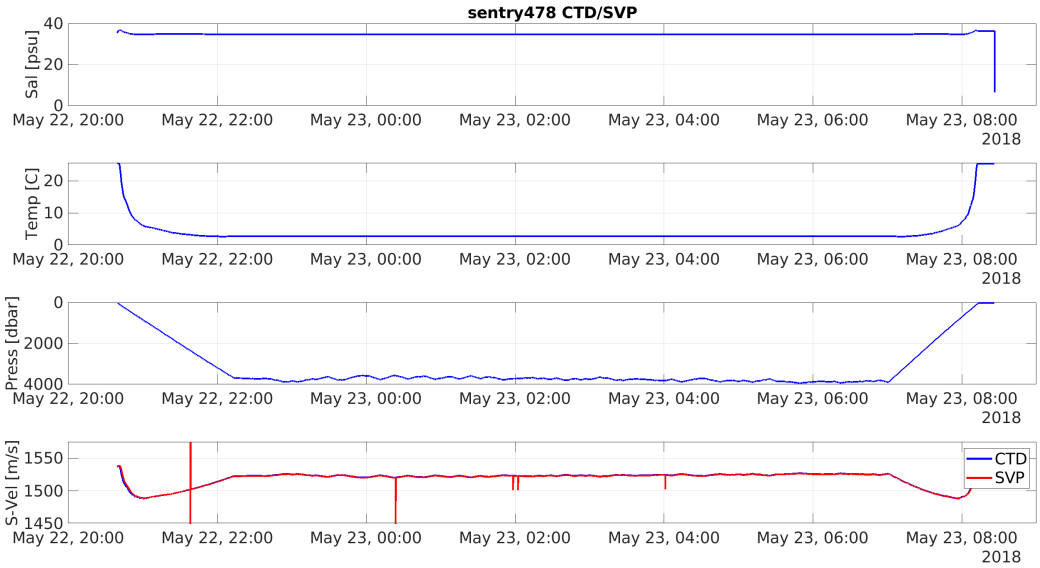


Figure 54: CTD and SVP sensor data

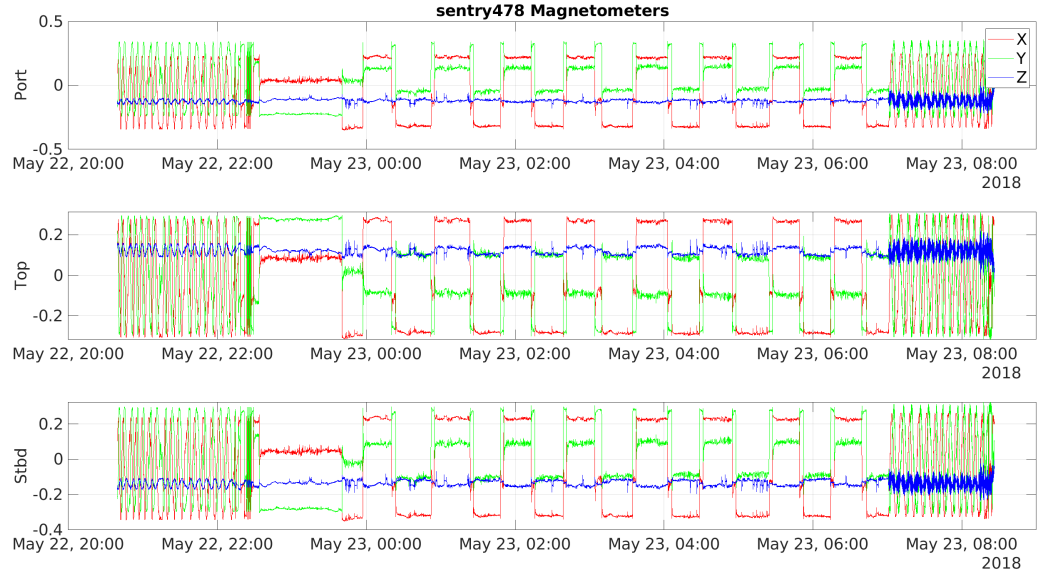


Figure 55: Magnetometer data from each of the three magnetometers on Sentry

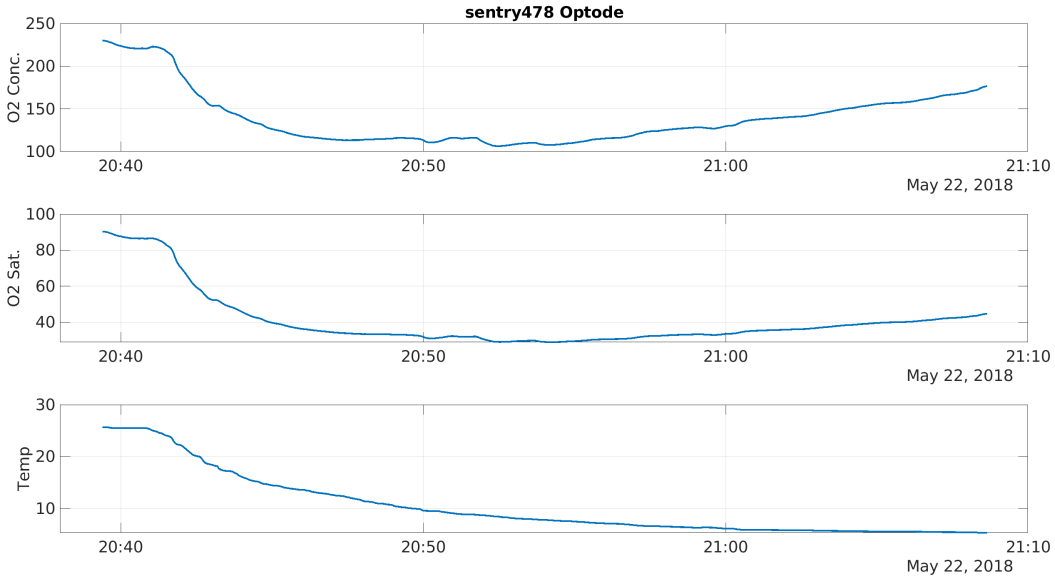


Figure 56: Optode temperature, O2 saturation, and concentration

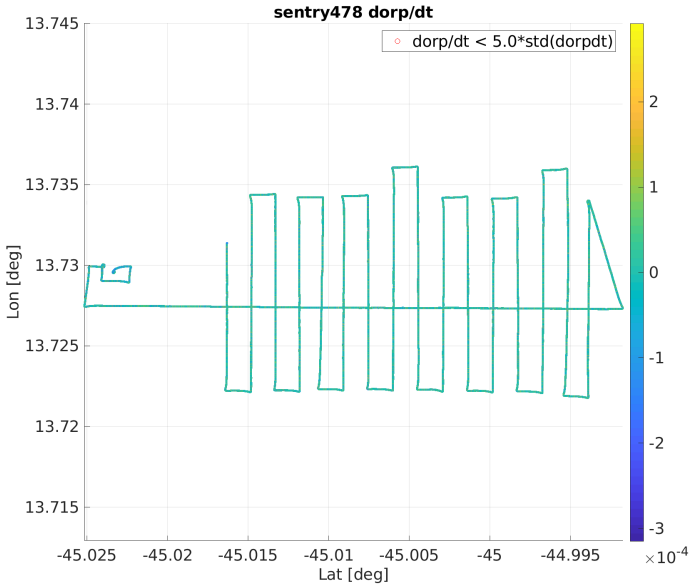


Figure 57: Navigated ORP sensor data.

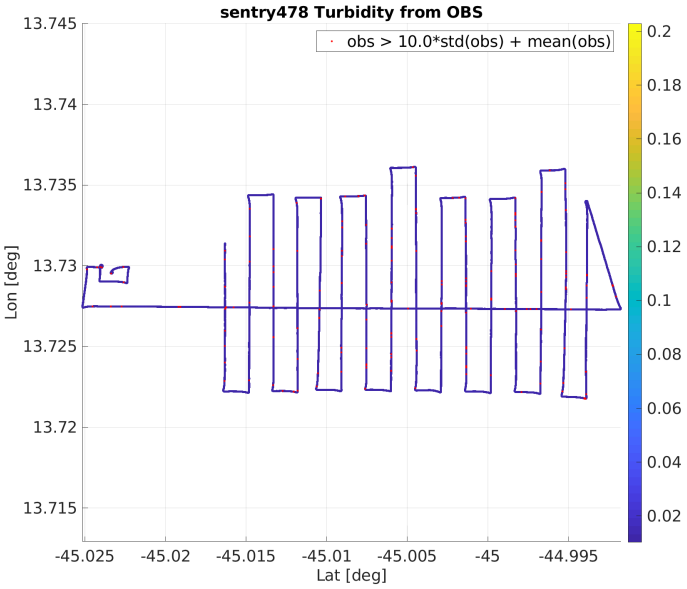


Figure 58: Navigated OBS sensor data.

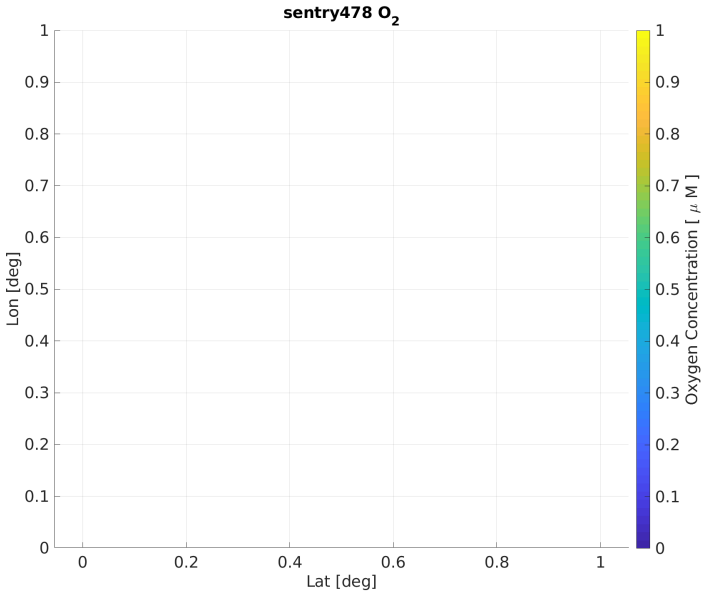


Figure 59: Navigated optode sensor data.

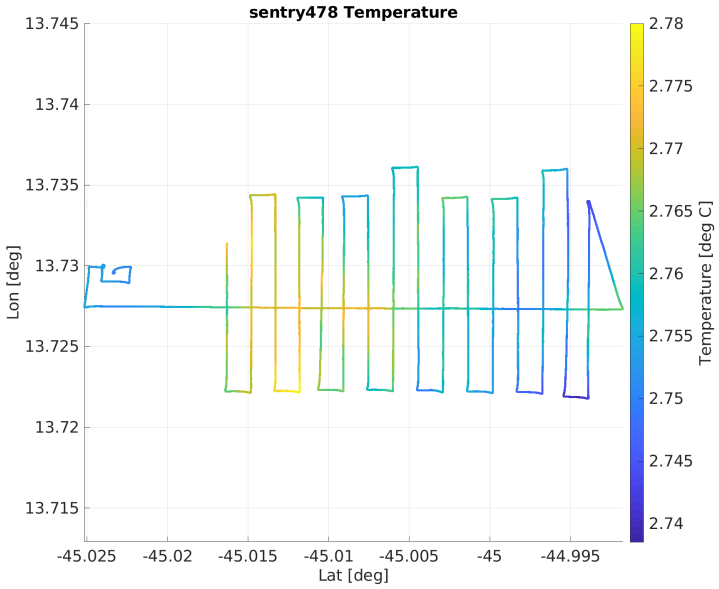
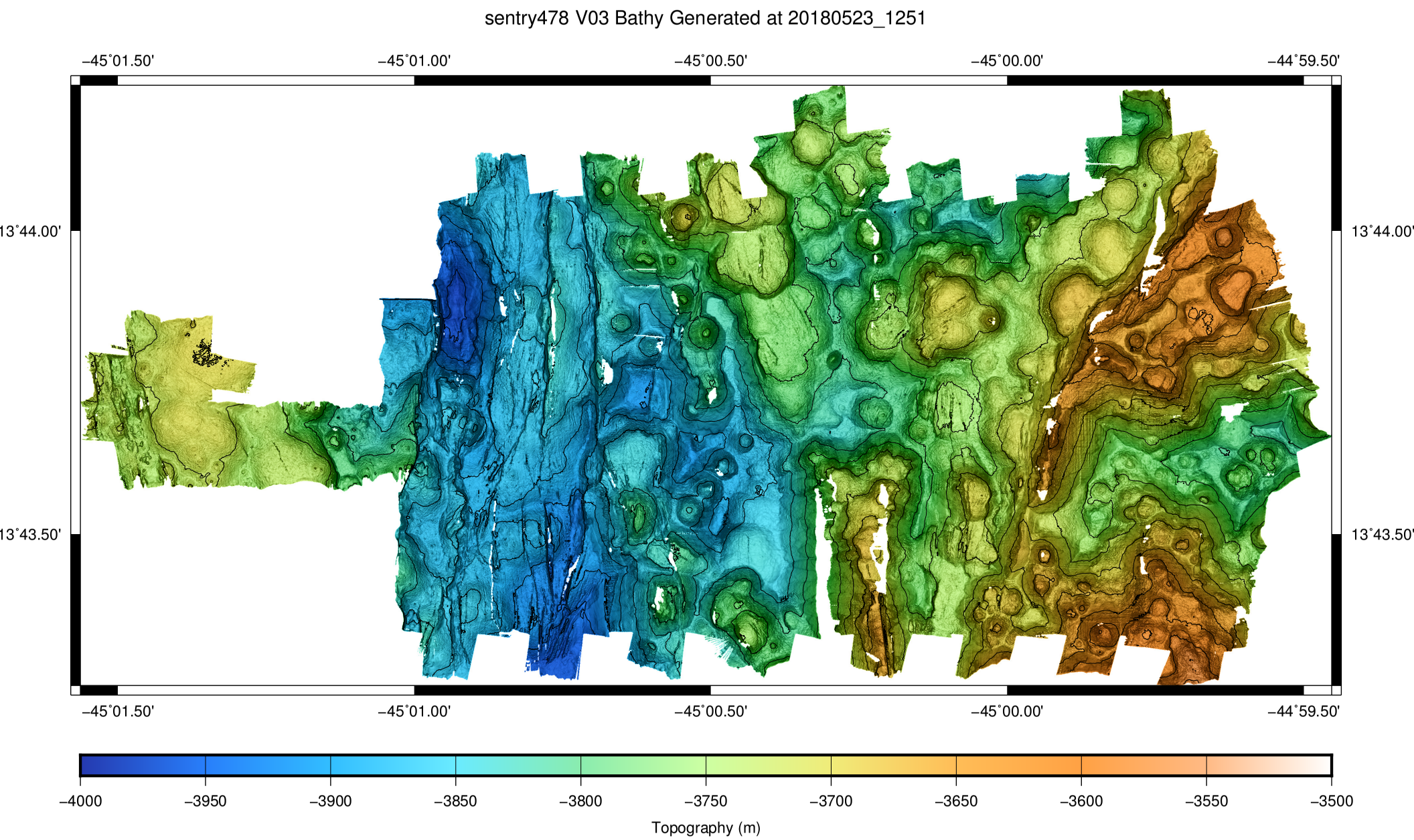


Figure 60: Navigated temperature sensor data


sentry478 V03 Bathy Generated at 20180523_1251
−45˚01.50'
−45˚01.00'
−45˚00.50'
−45˚00.00'
−44˚59.50'
13˚44.00'
13˚43.50'
−4000
−3950
−3900
−3850
−3800
−3750
−3700
−3650
−3600
−3550
−3500
Topography (m)

Sentry 479 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 12 to 18 knots, seas 5 to 8 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 42.0 -45 -4

Launch Position: sentry479 launch position: 13 48.925'N 045 0.400'W

Narrative

Sentry479 was the seventh dive of the cruise and the second dive on the core complex. This dive continued the core complex survey from east to west, covering an area of 2km by 1.5km.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3400m. Overall this dive went very well, capturing most of the intended survey area. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Waveglider operations aided in the ships ability to leave station by providing continued updates while the vessel was away from station. The frequency of uModem packets was lengthened from twice a minute to once a minute to save on iridium bandwidth costs.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.13 sentry479 Summary

sentry479 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/23 20:35:42
Survey start: 2018/05/23 22:02:05
Survey start: Lat:13.816734 Lon:-45.007066
Survey start: Lat:13 49.004'N Lon:045 0.424'W
Survey end: 2018/05/24 07:09:51
Survey end: Lat:13.815207 Lon:-45.004968
Survey end: Lat:13 48.912'N Lon:045 0.298'W
Ascent begins: 2018/05/24 07:09:51
On the surface: 2018/05/24 08:13:43
On deck: 2018/05/24 08:25:57
descent rate: 38.1 m/min
ascent rate: 52.3 m/min
survey time: 9.1 hours
deck-to-deck time 11.8 hours
Min survey depth: 3204m
Max survey depth: 3554m
Mean survey depth: 3387m
Mean survey height: 82m
distance travelled: 30.74km
average speed: 0.92m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.92 m/s over 30.74 km
total vertical during survey: 7812m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.1 kwhr
Battery energy on surface: 10.9 kwhr
Battery energy on deck: 10.8 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry479/nav-sci/proc directory within the sentry479_config matlab structure as well as in ascii text logs in sentry479/metadata. At present metadata is not yet automatically collected on all sensors.

0.14 sentry479 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180523_1801.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180523_1802.cfg`
CTD	SBE 49	260		`sbe49_20180523_1802.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180523_1801.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

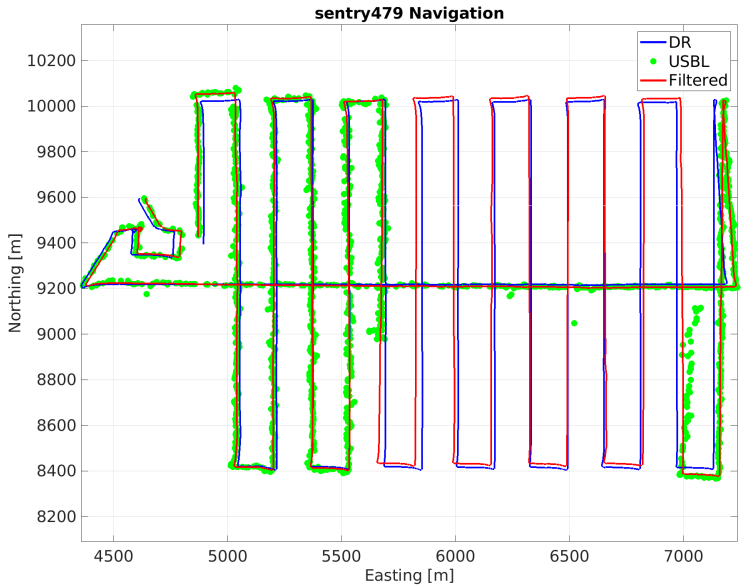


Figure 61: Latitude/Longitude plot of Sentry dive 479 based on post-processed navigation

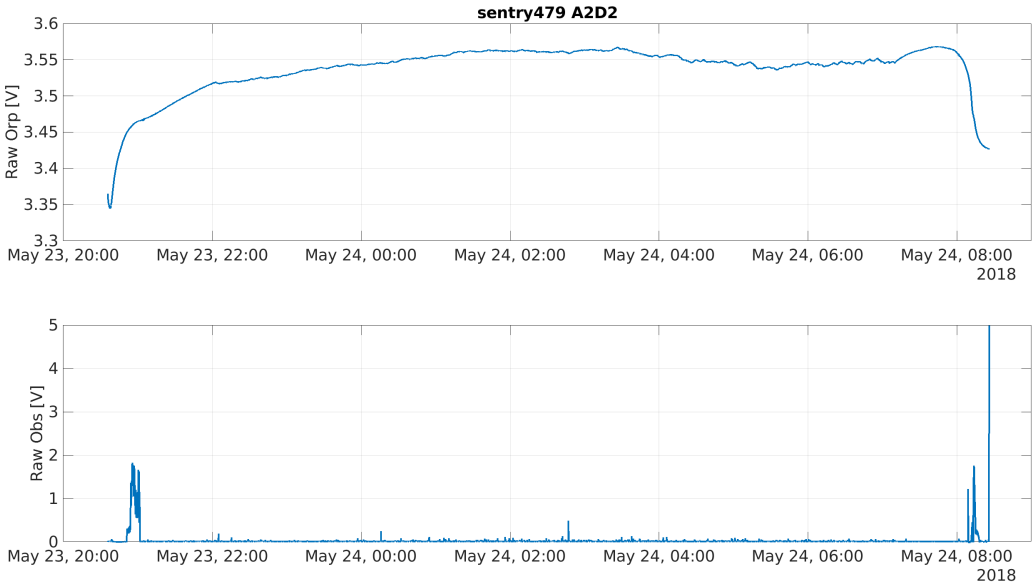


Figure 62: Raw analog Sensor Data

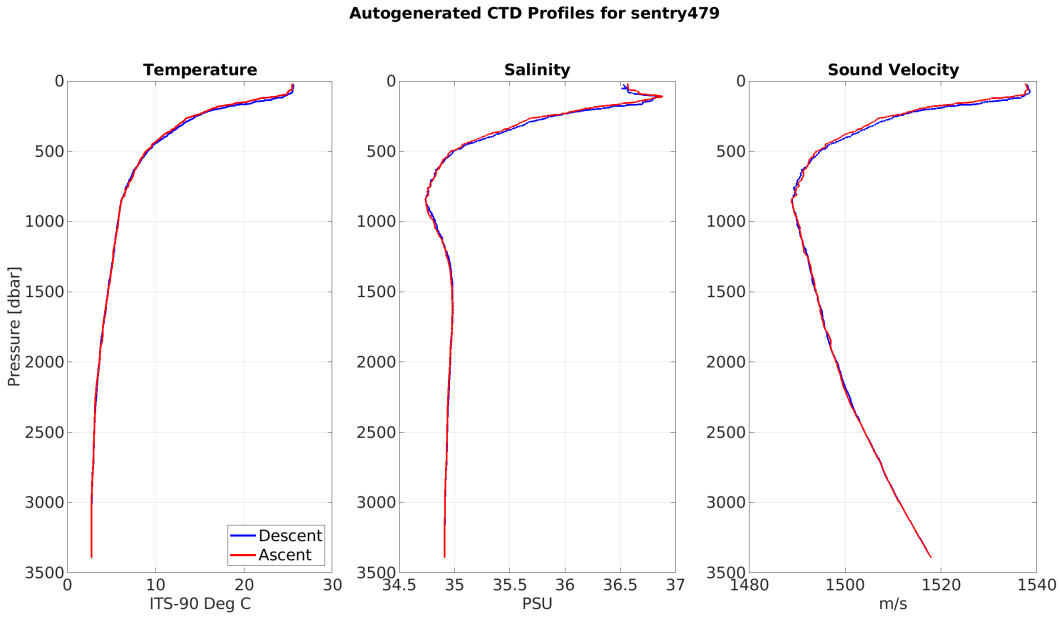


Figure 63: CTD profile sensor data

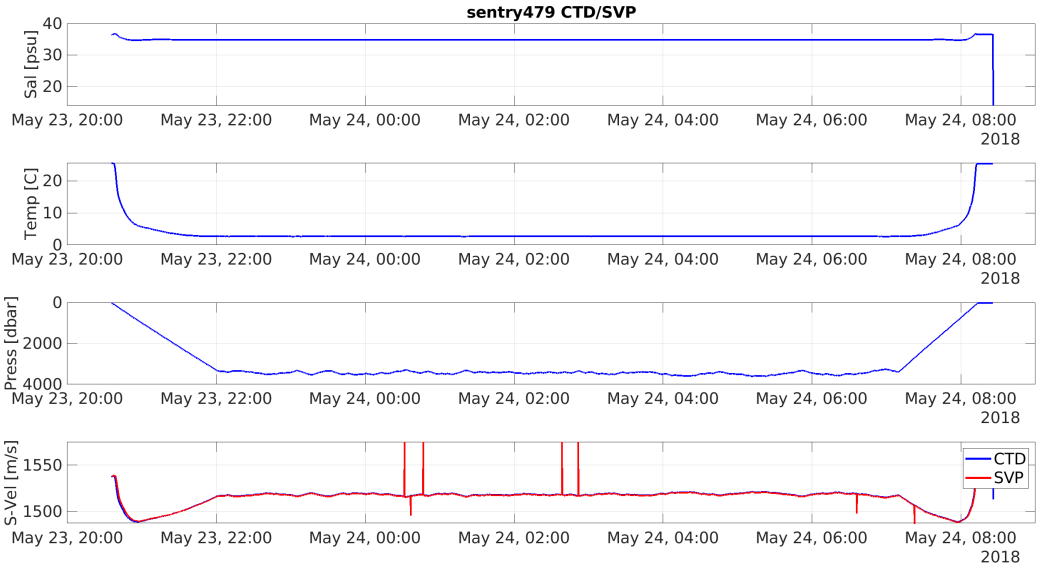


Figure 64: CTD and SVP sensor data

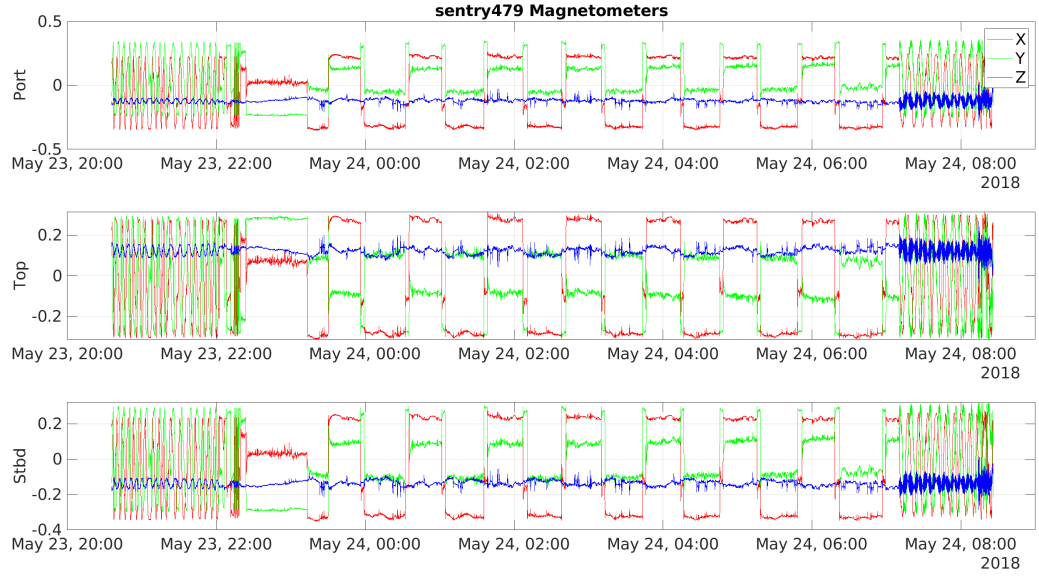


Figure 65: Magnetometer data from each of the three magnetometers on Sentry

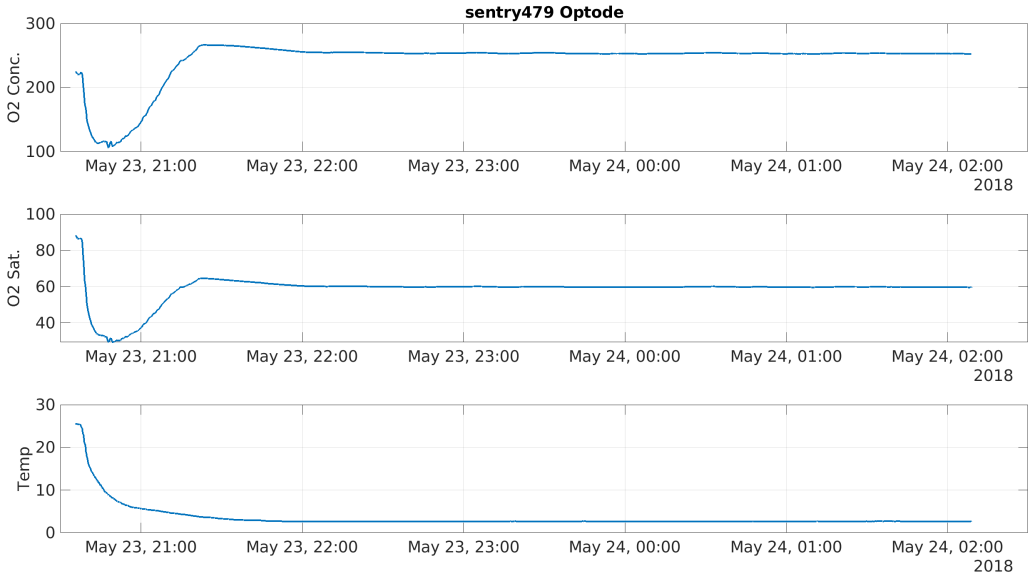


Figure 66: Optode temperature, O2 saturation, and concentration

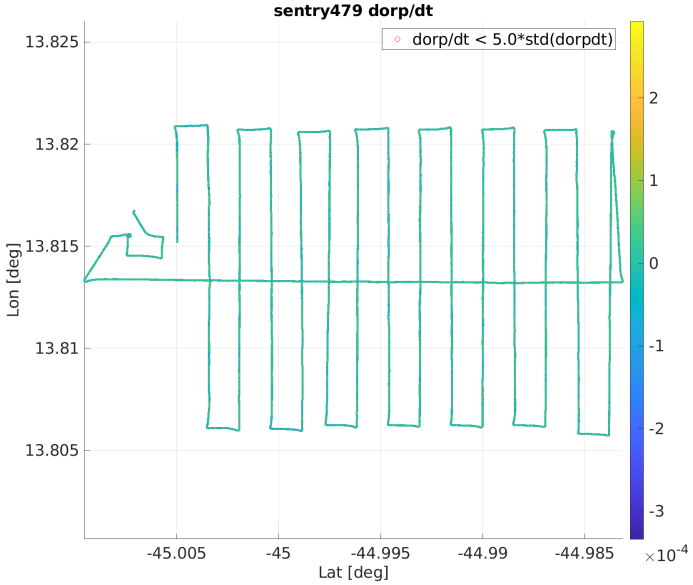


Figure 67: Navigated ORP sensor data.

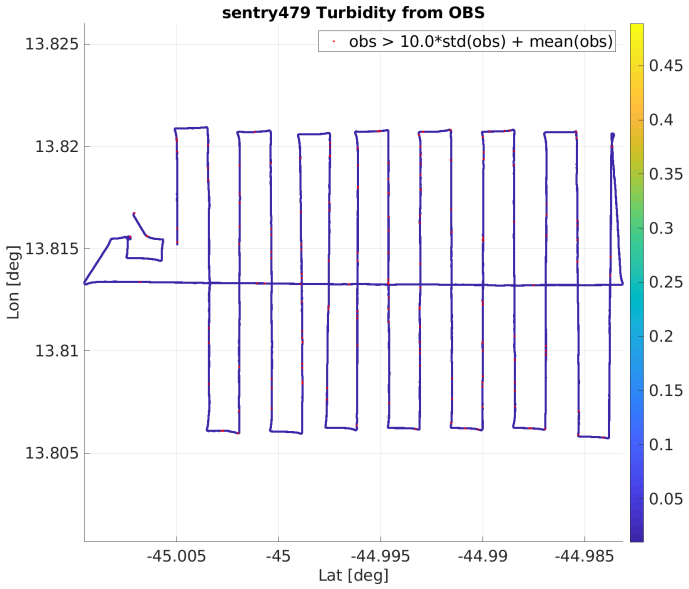


Figure 68: Navigated OBS sensor data.

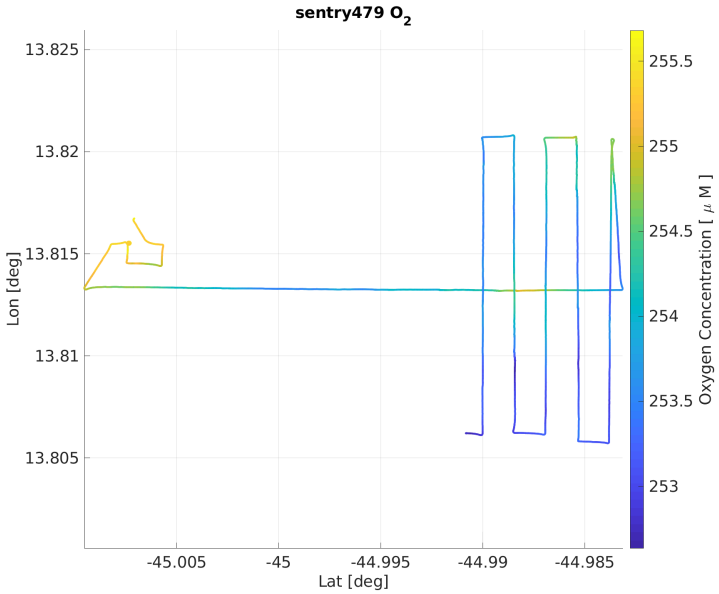


Figure 69: Navigated optode sensor data.

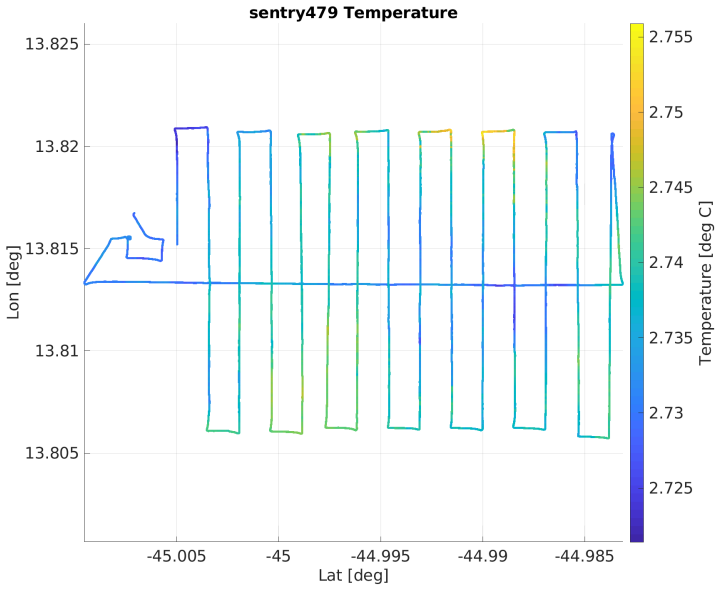
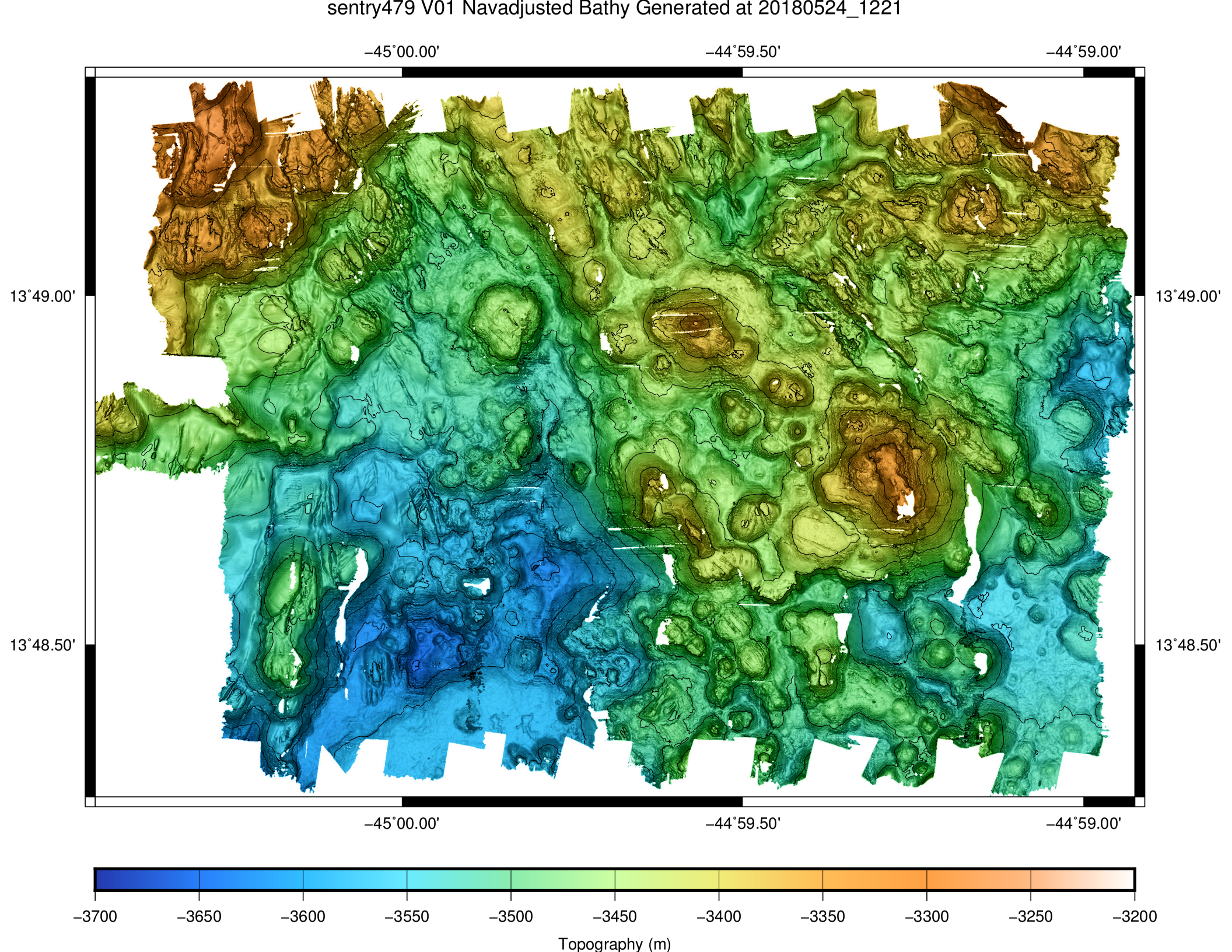


Figure 70: Navigated temperature sensor data


sentry479 V01 Navadjusted Bathy Generated at 20180524_1221
−45˚00.00'
−44˚59.50'
−44˚59.00'
13˚49.00'
13˚48.50'
−3700
−3650
−3600
−3550
−3500
−3450
−3400
−3350
−3300
−3250
−3200
Topography (m)

Sentry 480 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 12 to 18 knots, seas 5 to 6 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 42.0 -45 -4

Launch Position: sentry480 launch position: 13 45.750'N 045 1.988'W

Narrative

Sentry480 was the eighth dive of the cruise and the sixth dive on the popping rocks ridge area1. This dive continued the popping rocks ridge survey to the west. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3700m. Overall this dive went well, capturing most of the intended survey area. The terrain was more difficult than previous dives, causing less area then expected to be covered. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. The cable for the gravity core parted and the gravity core was lost. Atlantis returned and tracked sentry for the remainder of the survey. Sentry was manually aborted to ensure an on time arrival for Alvin operations. Waveglider operations aided in the ships ability to leave station by providing continued updates while the vessel was away from station.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.15 sentry480 Summary

sentry480 Summary
Origin: 13.700000 -45.066667
Origin: 13 42.000'N 045 4.000'W
Launch: 2018/05/24 20:30:03
Survey start: 2018/05/24 22:02:10
Survey start: Lat:13.763287 Lon:-45.033698
Survey start: Lat:13 45.797'N Lon:045 2.022'W
Survey end: 2018/05/25 07:08:57
Survey end: Lat:13.759901 Lon:-45.031621
Survey end: Lat:13 45.594'N Lon:045 1.897'W
Ascent begins: 2018/05/25 07:08:57
On the surface: 2018/05/25 08:16:38
On deck: 2018/05/25 08:27:54
descent rate: 38.1 m/min
ascent rate: 51.9 m/min
survey time: 9.1 hours
deck-to-deck time 12.0 hours
Min survey depth: 3424m
Max survey depth: 3864m
Mean survey depth: 3664m
Mean survey height: 86m
distance travelled: 30.34km
average speed: 0.91m/s
average speed during photo runs: 0.63 m/s over 0.01 km
average speed during multibeam runs: 0.91 m/s over 30.34 km
total vertical during survey: 7367m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.2 kwhr
Battery energy on surface: 11.0 kwhr
Battery energy on deck: 10.9 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry480/nav-sci/proc directory within the sentry480_config matlab structure as well as in ascii text logs in sentry480/metadata. At present metadata is not yet automatically collected on all sensors.

0.16 sentry480 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180524_1758.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180524_1759.cfg`
CTD	SBE 49	260		`sbe49_20180524_1759.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180524_1759.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

Figure 71: Latitude/Longitude plot of Sentry dive 480 based on post-processed navigation

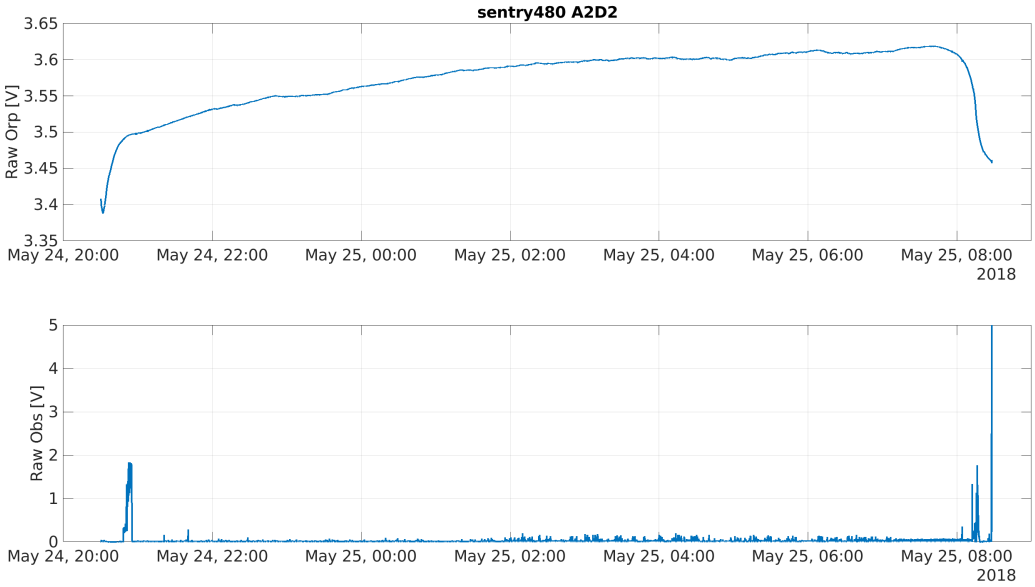


Figure 72: Raw analog Sensor Data

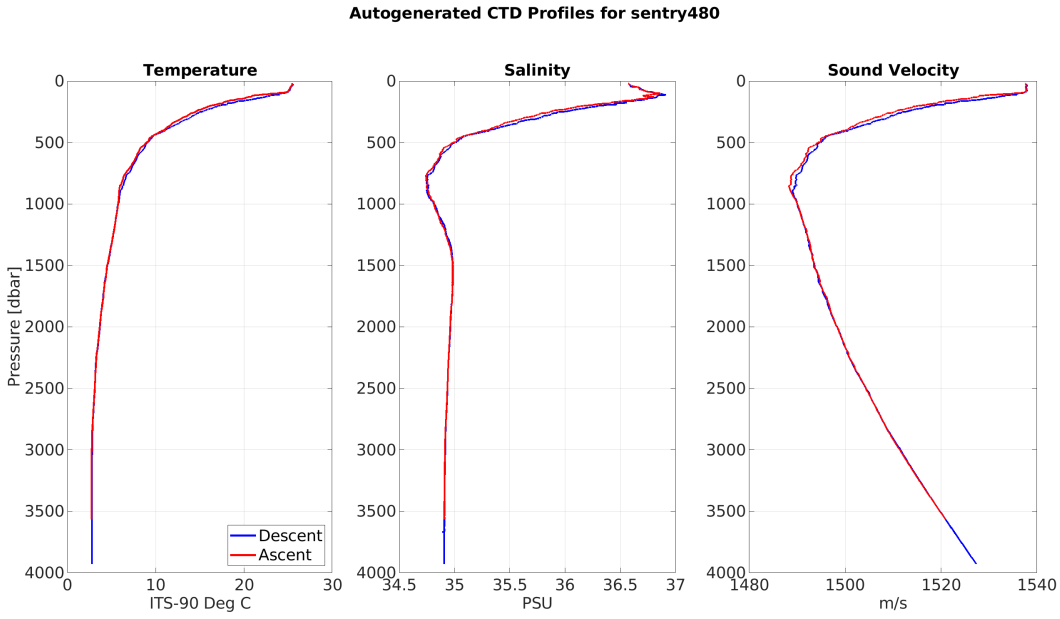


Figure 73: CTD profile sensor data

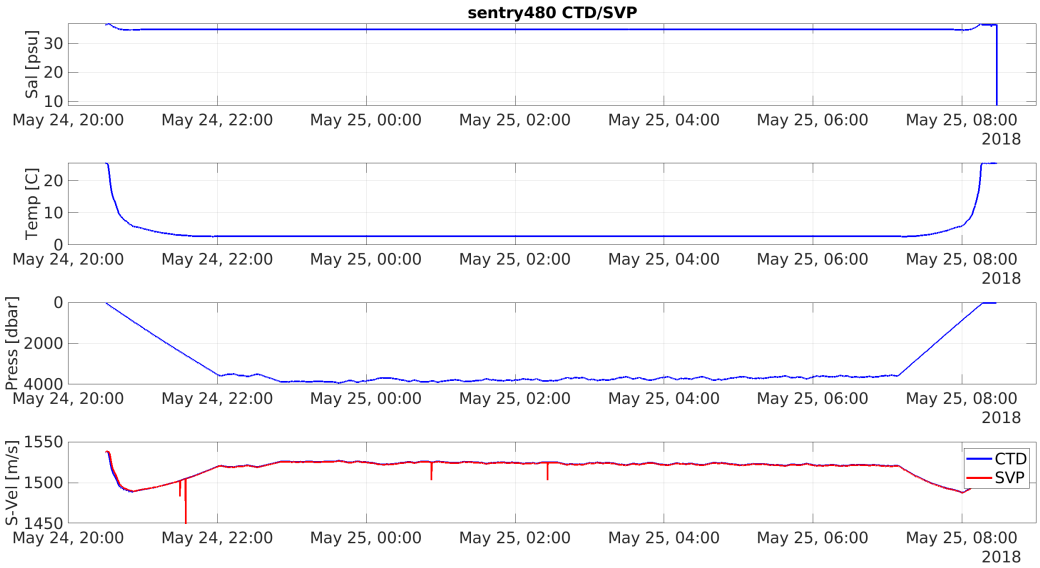


Figure 74: CTD and SVP sensor data

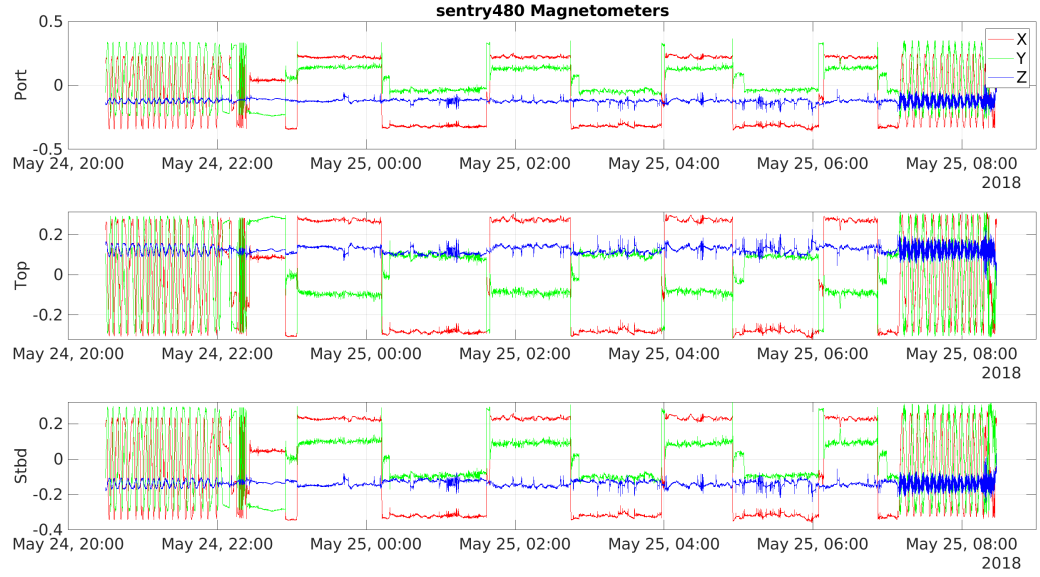


Figure 75: +Magnetometer data from each of the three magnetometers on Sentry

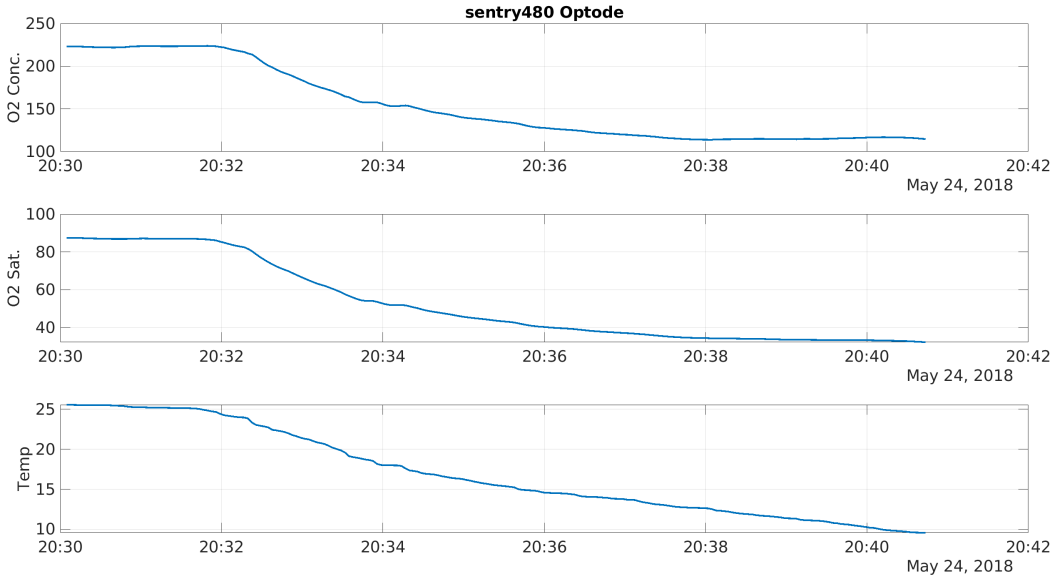


Figure 76: Optode temperature, O2 saturation, and concentration

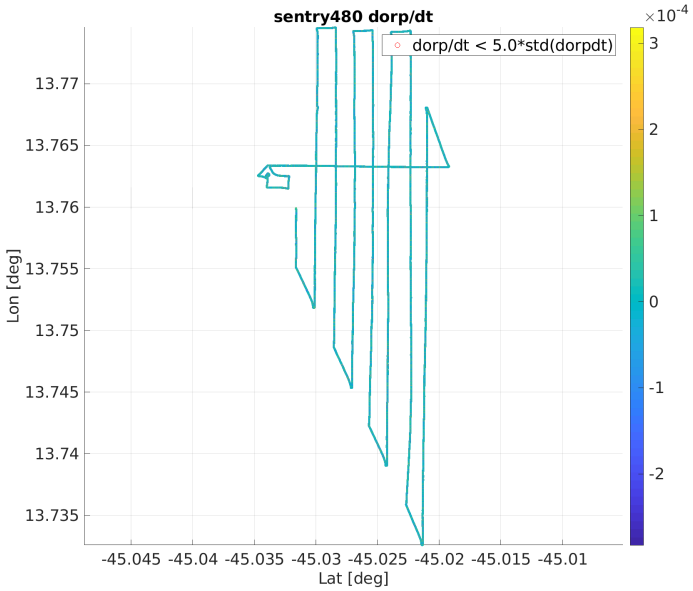


Figure 77: Navigated ORP sensor data.

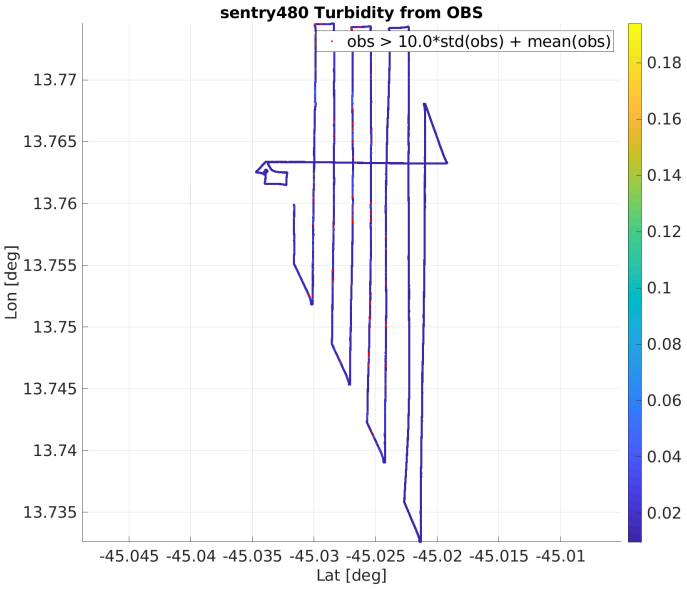


Figure 78: Navigated OBS sensor data.

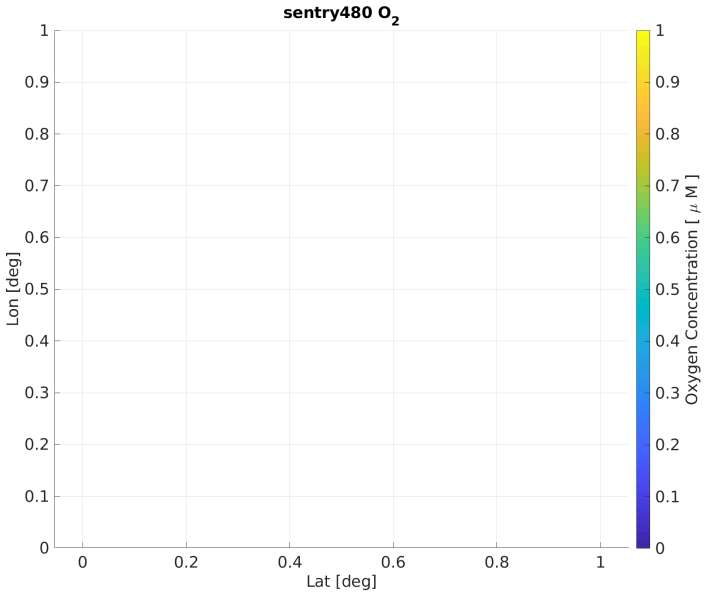


Figure 79: Navigated optode sensor data.

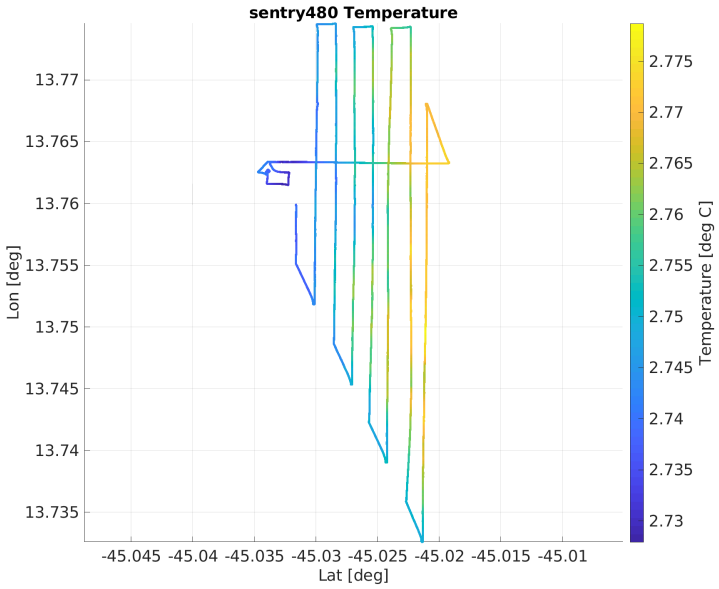
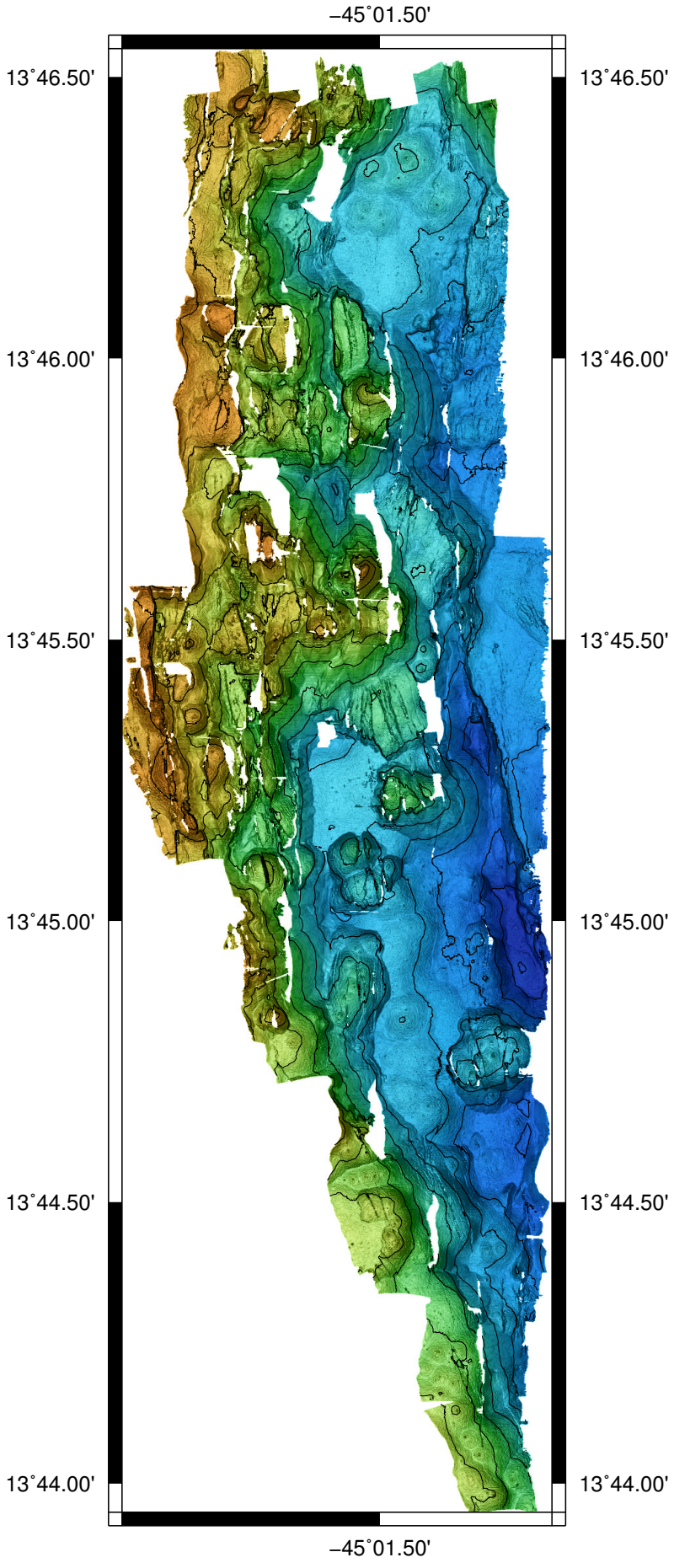
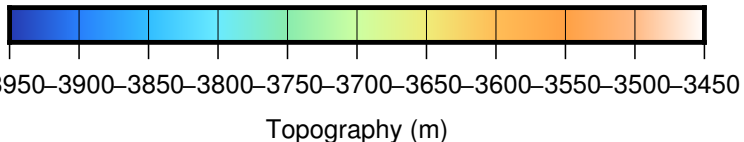


Figure 80: Navigated temperature sensor data

sentry480 V12 Bathy Generated at 20180525_1734





Sentry 481 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 54 -45 -4.5

Launch Position: sentry481 launch position: 13 56.100'N 045 2.551'W

Narrative

Sentry481 was the ninth dive of the cruise and the first dive at area4. This dive covered an area of 1.5km tall by 2.4km wide, in the middle of the rift valley. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3000m. Overall this dive went well, capturing all of the intended survey area. The terrain was less difficult than previous dives allowing more terrain to be covered. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. Sentry was manually aborted to ensure an on time arrival for Alvin operations. Waveglider operations aided in the ships ability to leave station by providing continued updates while the vessel was away from station.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.17 sentry481 Summary

sentry481 Summary
Origin: 13.900000 -45.075000
Origin: 13 54.000'N 045 4.500'W
Launch: 2018/05/25 20:31:43
Survey start: 2018/05/25 21:49:49
Survey start: Lat:13.936071 Lon:-45.042734
Survey start: Lat:13 56.164'N Lon:045 2.564'W
Survey end: 2018/05/26 06:59:15
Survey end: Lat:13.934903 Lon:-45.038458
Survey end: Lat:13 56.094'N Lon:045 2.308'W
Ascent begins: 2018/05/26 06:59:15
On the surface: 2018/05/26 07:56:26
On deck: 2018/05/26 08:09:52
descent rate: 38.1 m/min
ascent rate: 52.2 m/min
survey time: 9.2 hours
deck-to-deck time 11.6 hours
Min survey depth: 2932m
Max survey depth: 3089m
Mean survey depth: 3028m
Mean survey height: 74m
distance travelled: 32.69km
average speed: 0.98m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.98 m/s over 32.69 km
total vertical during survey: 4867m
Battery energy at launch: 20.7 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.7 kwhr
Battery energy on surface: 11.7 kwhr
Battery energy on deck: 11.6 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry481/nav-sci/proc directory within the sentry481_config matlab structure as well as in ascii text logs in sentry481/metadata. At present metadata is not yet automatically collected on all sensors.

0.18 sentry481 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180525_1803.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180525_1803.cfg`
CTD	SBE 49	260		`sbe49_20180525_1804.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180525_1803.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

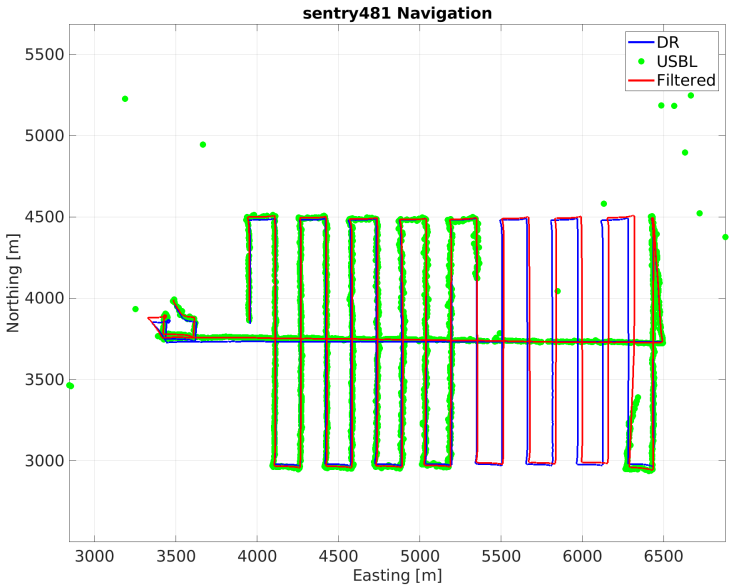


Figure 81: Latitude/Longitude plot of Sentry dive 481 based on post-processed navigation

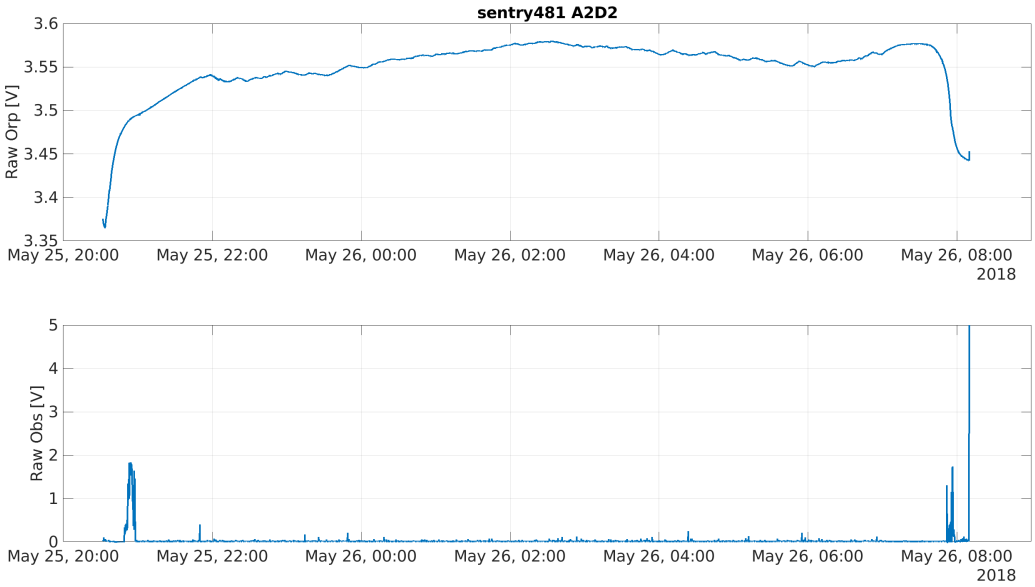


Figure 82: Raw analog Sensor Data

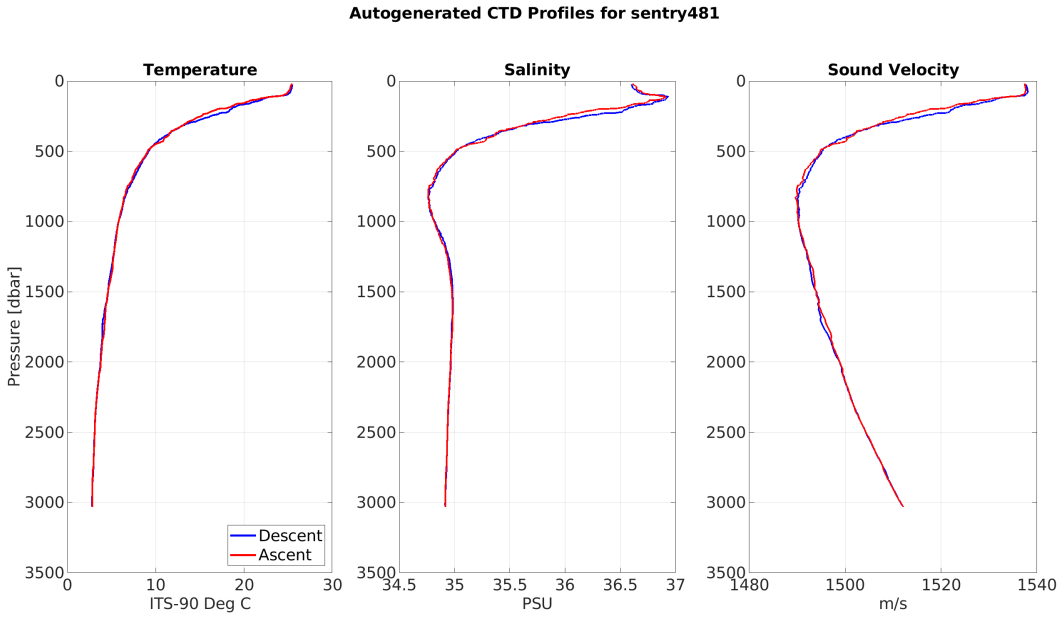


Figure 83: CTD profile sensor data

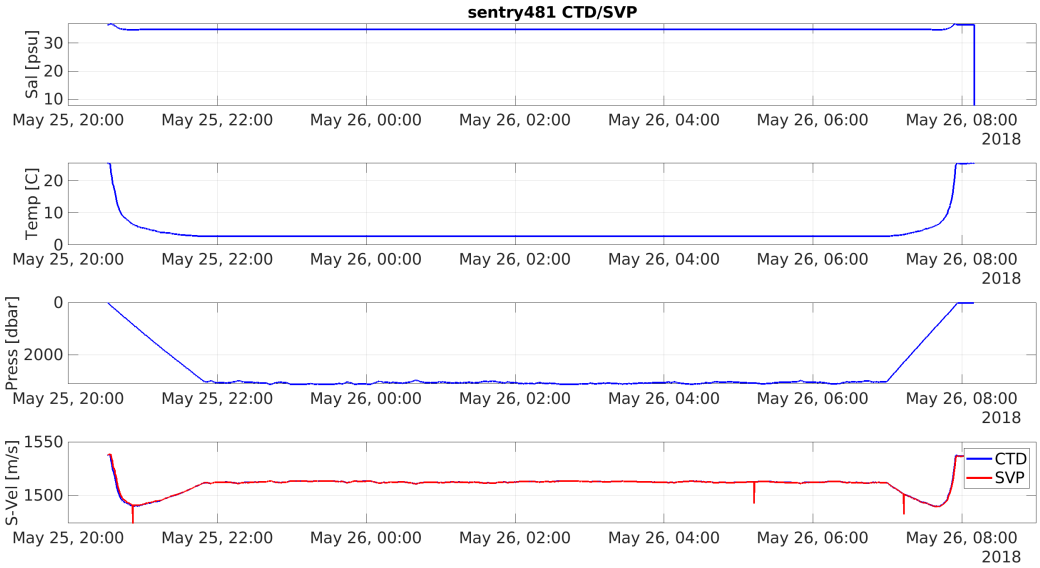


Figure 84: CTD and SVP sensor data

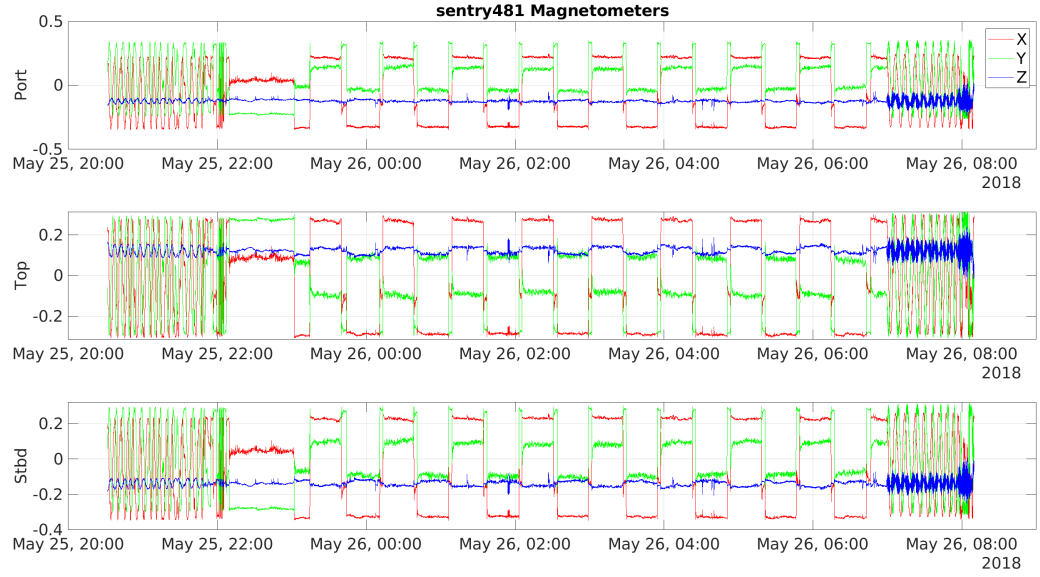


Figure 85: Magnetometer data from each of the three magnetometers on Sentry

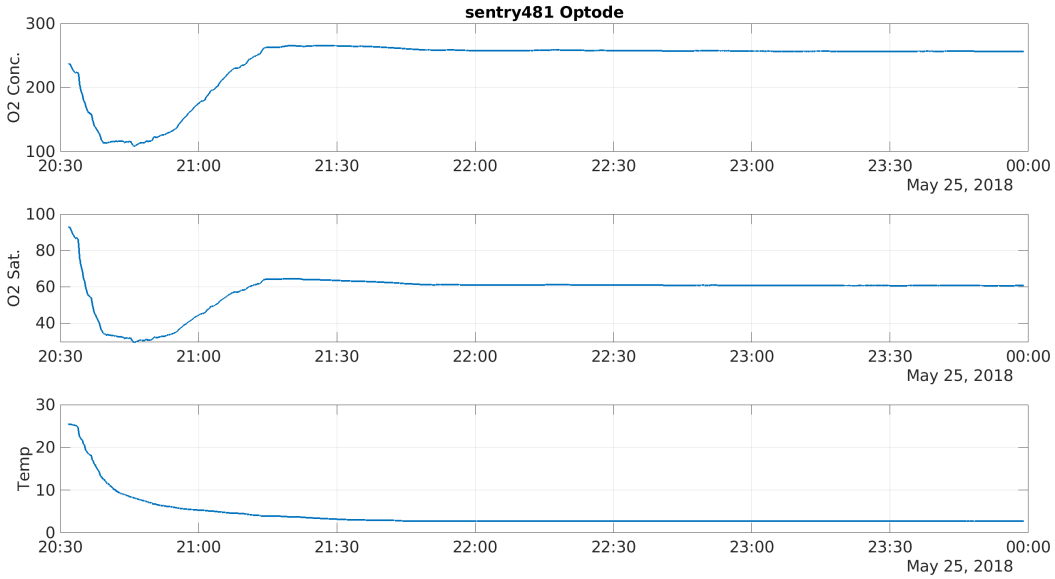


Figure 86: Optode temperature, O2 saturation, and concentration

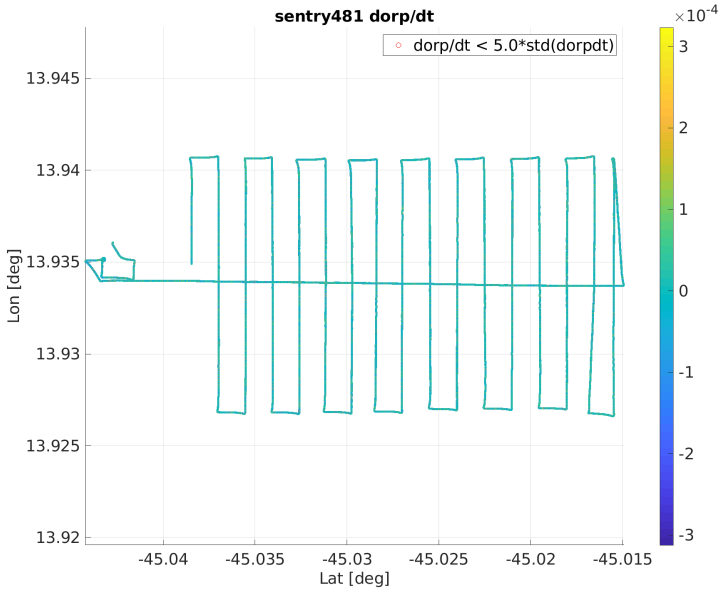


Figure 87: Navigated ORP sensor data.

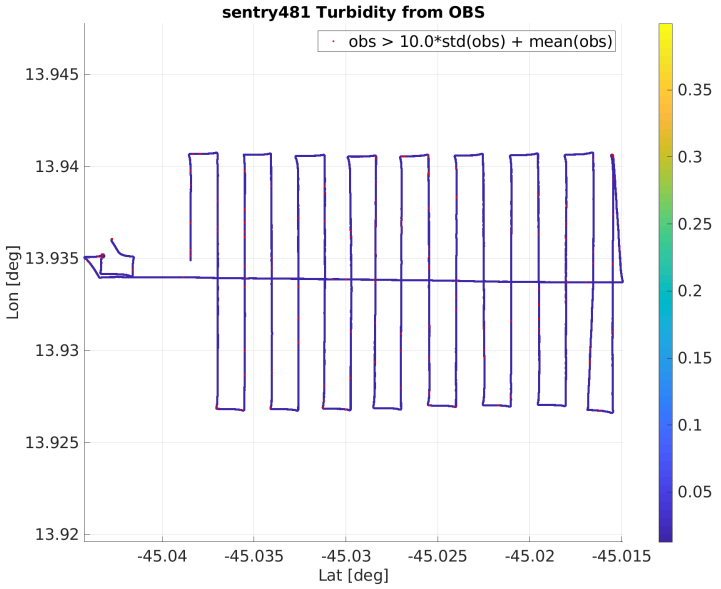


Figure 88: Navigated OBS sensor data.

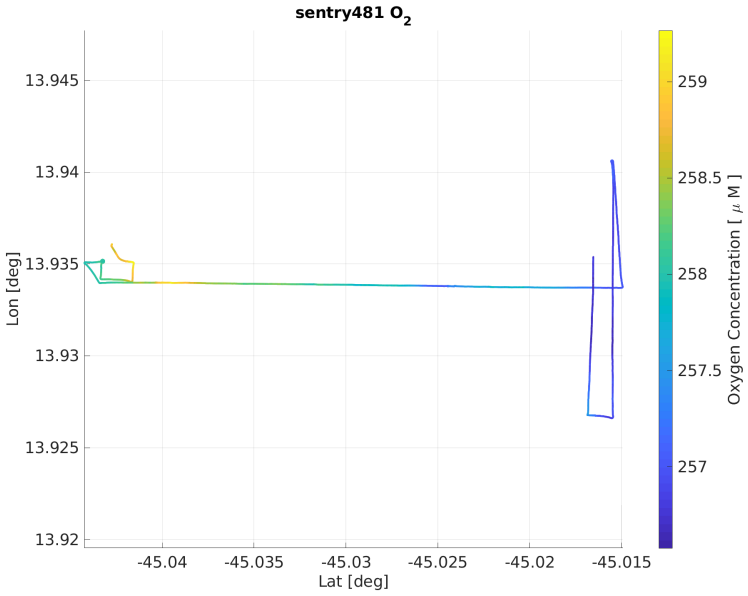


Figure 89: Navigated optode sensor data.

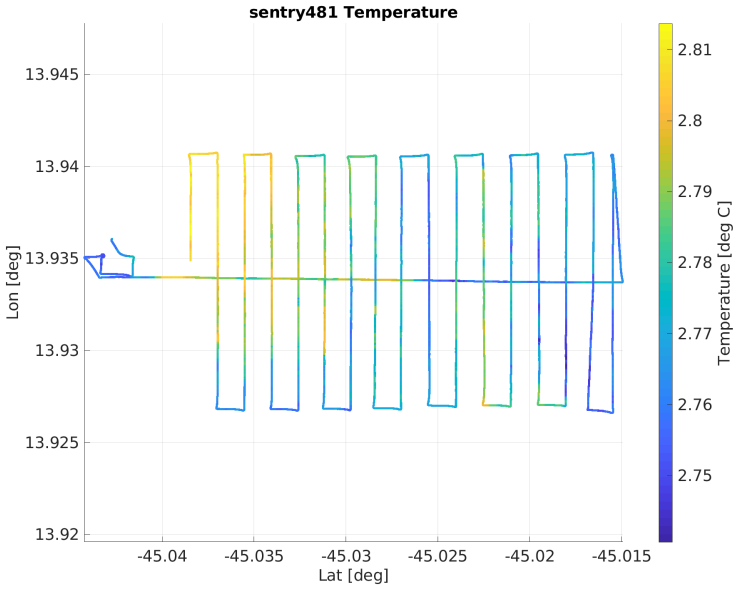
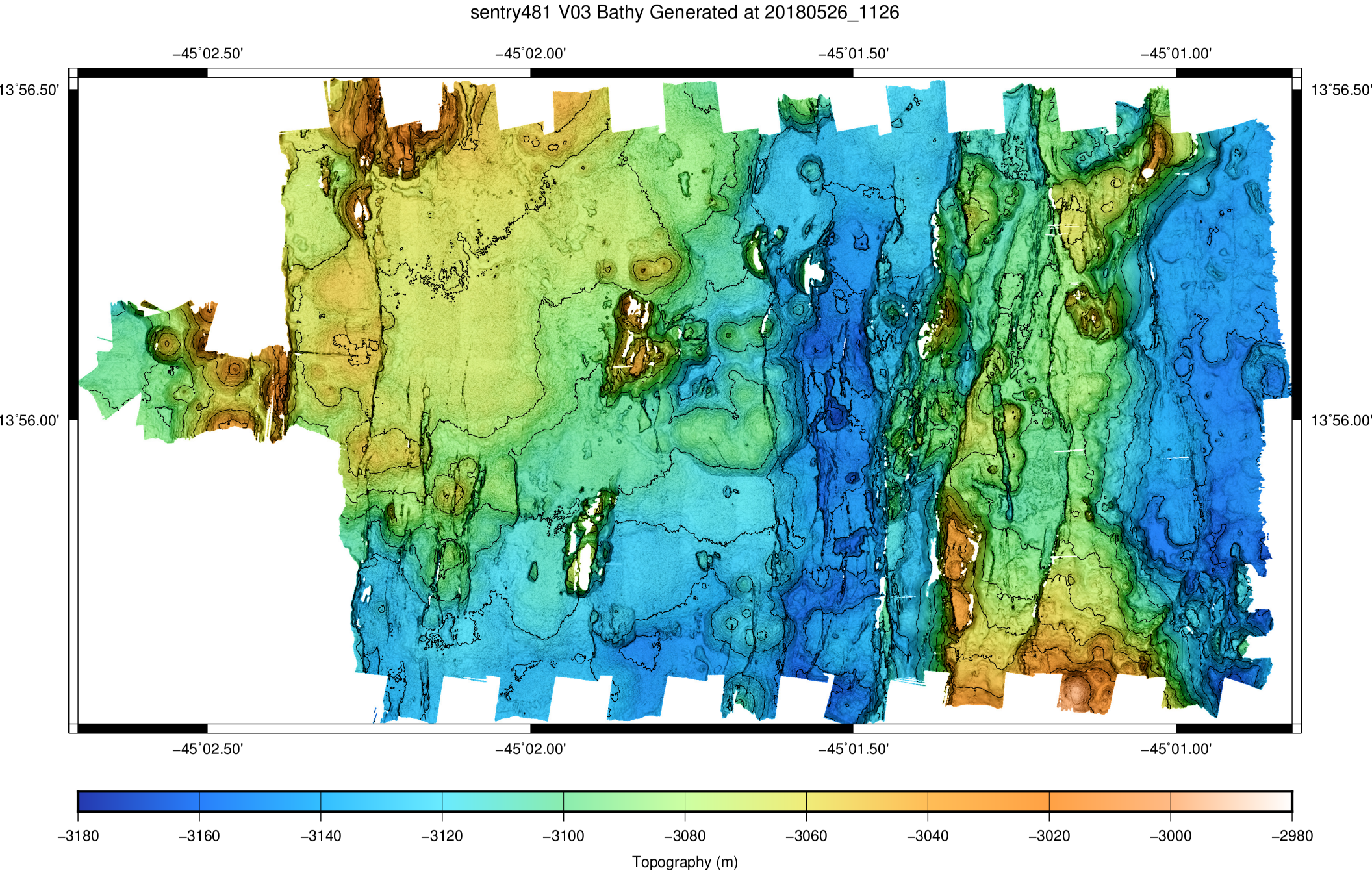


Figure 90: Navigated temperature sensor data


sentry481 V03 Bathy Generated at 20180526_1126
−45˚02.50'
−45˚02.00'
−45˚01.50'
−45˚01.00'
13˚56.50'
13˚56.00'
−3180
−3160
−3140
−3120
−3100
−3080
−3060
−3040
−3020
−3000
−2980
Topography (m)

Sentry 482 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 54 -45 -4.5

Launch Position: sentry482 launch position: 13 55.979'N 045 3.250'W

Narrative

Sentry482 was the tenth dive of the cruise and the second dive at area4. This dive covered an area of 1.5km tall by 2.4km wide west of the sentry481 survey. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3000m. Overall this dive went well, capturing all of the intended survey area. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.19 sentry482 Summary

sentry482 Summary
Origin: 13.900000 -45.075000
Origin: 13 54.000'N 045 4.500'W
Launch: 2018/05/26 20:48:23
Survey start: 2018/05/26 22:08:36
Survey start: Lat:13.934709 Lon:-45.054558
Survey start: Lat:13 56.083'N Lon:045 3.273'W
Survey end: 2018/05/27 07:06:43
Survey end: Lat:13.940828 Lon:-45.059262
Survey end: Lat:13 56.450'N Lon:045 3.556'W
Ascent begins: 2018/05/27 07:06:43
On the surface: 2018/05/27 08:02:05
On deck: 2018/05/27 08:21:41
descent rate: 38.5 m/min
ascent rate: 52.0 m/min
survey time: 9.0 hours
deck-to-deck time 11.6 hours
Min survey depth: 2878m
Max survey depth: 3115m
Mean survey depth: 3027m
Mean survey height: 76m
distance travelled: 31.16km
average speed: 0.95m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.95 m/s over 31.16 km
total vertical during survey: 5333m
Battery energy at launch: 20.7 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 11.8 kwhr
Battery energy on surface: 11.8 kwhr
Battery energy on deck: 11.6 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry482/nav-sci/proc directory within the sentry482_config matlab structure as well as in ascii text logs in sentry482/metadata. At present metadata is not yet automatically collected on all sensors.

0.20 sentry482 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180526_1825.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180526_1825.cfg`
CTD	SBE 49	260		`sbe49_20180526_1826.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180526_1825.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

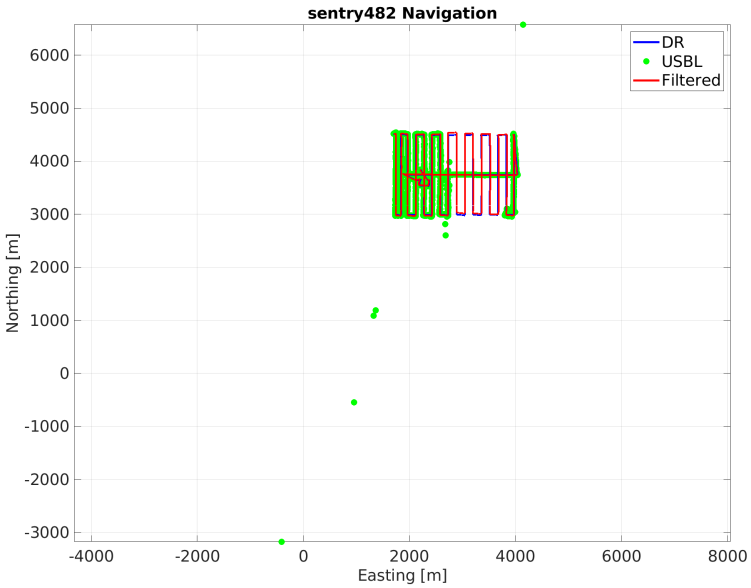


Figure 91: Latitude/Longitude plot of Sentry dive 482 based on post-processed navigation

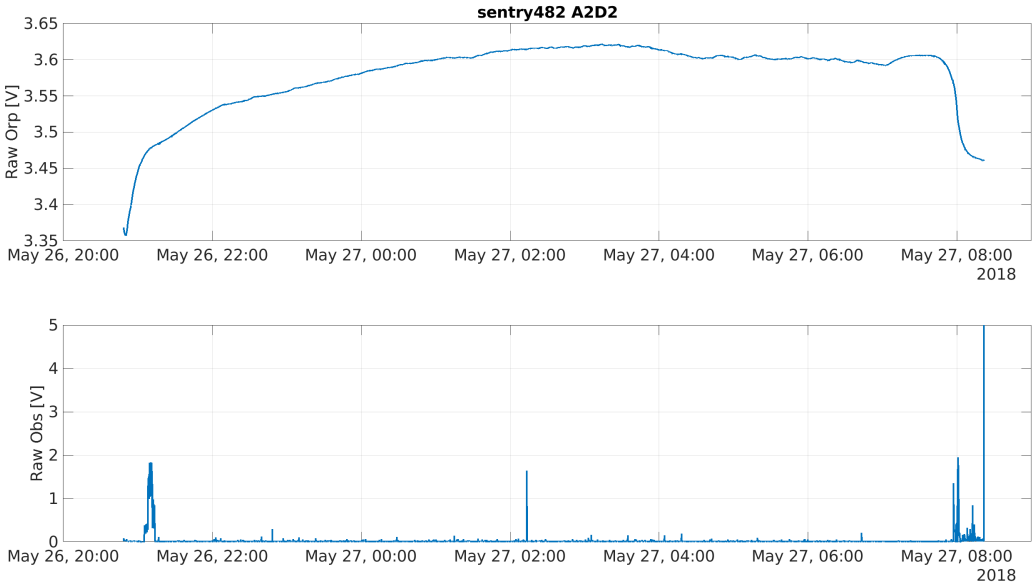


Figure 92: Raw analog Sensor Data

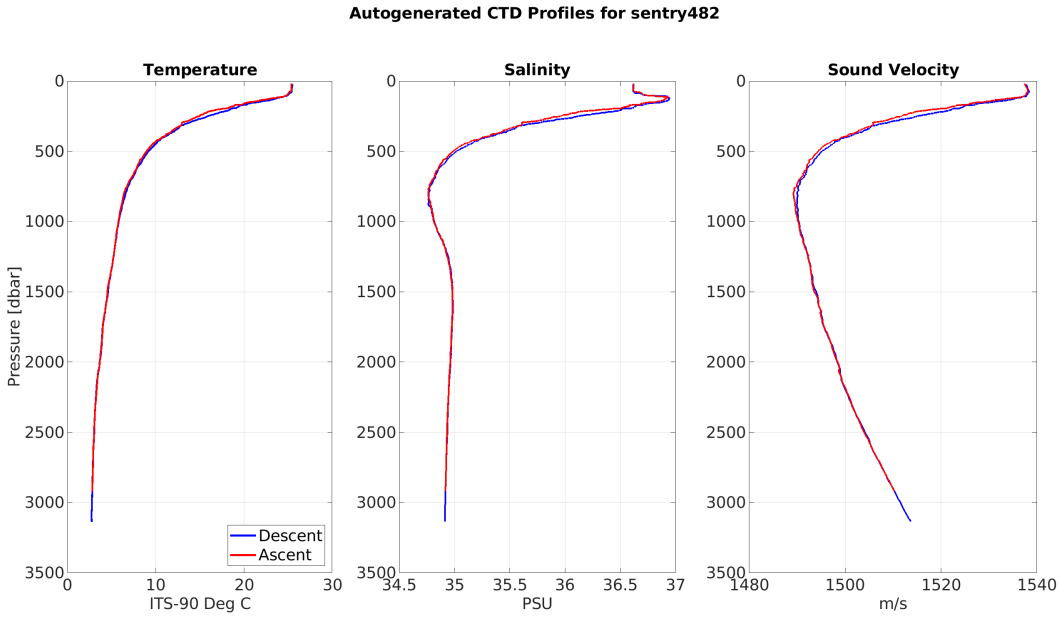


Figure 93: CTD profile sensor data

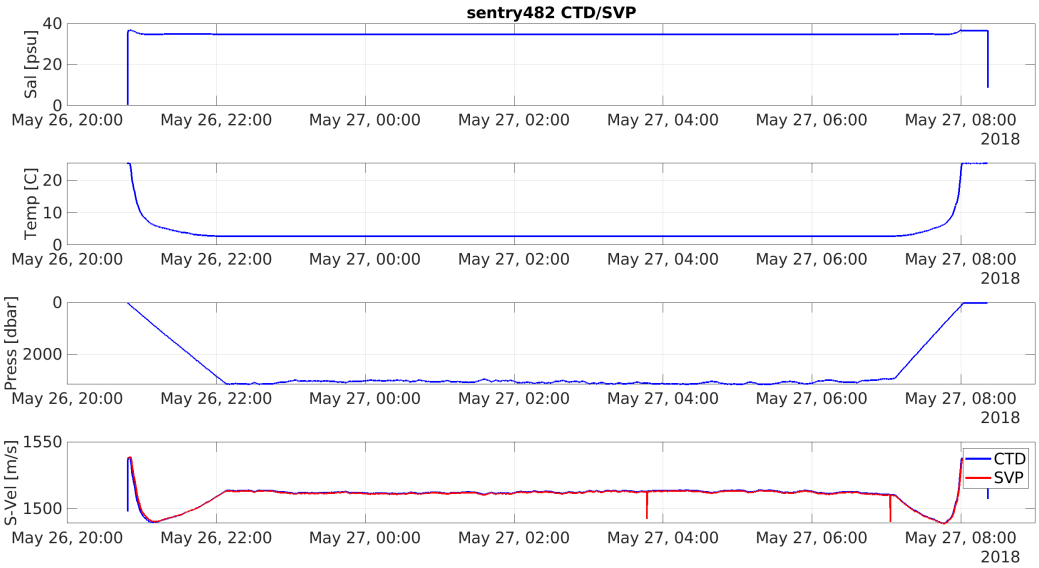


Figure 94: CTD and SVP sensor data

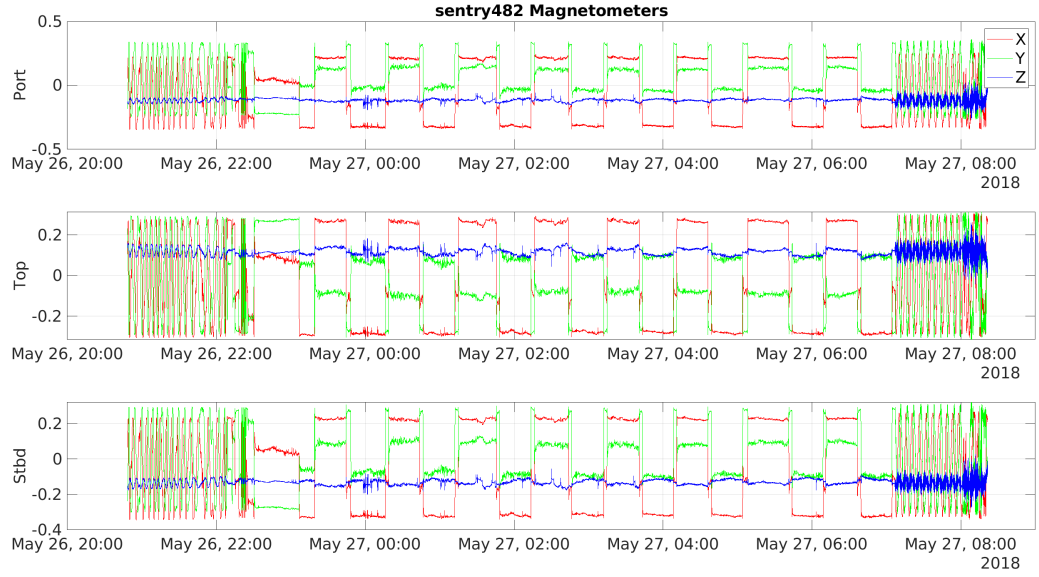


Figure 95: Magnetometer data from each of the three magnetometers on Sentry

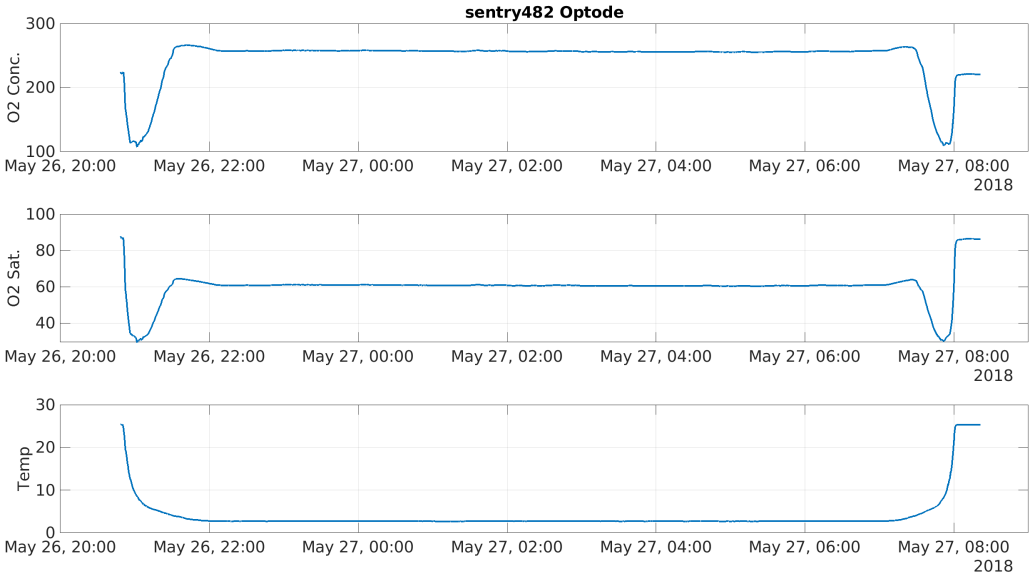


Figure 96: Optode temperature, O2 saturation, and concentration

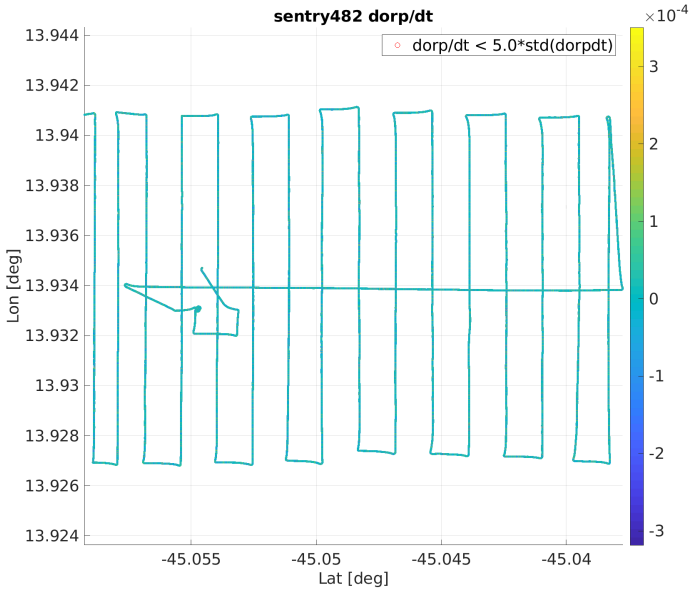


Figure 97: Navigated ORP sensor data.

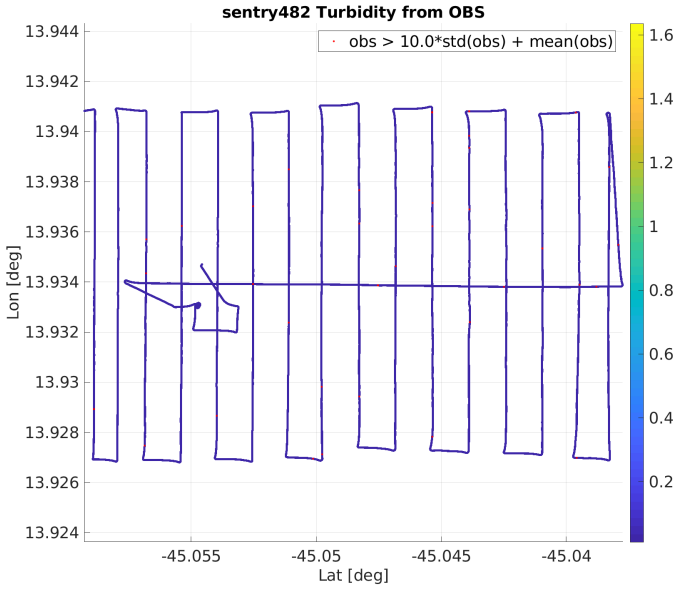


Figure 98: Navigated OBS sensor data.

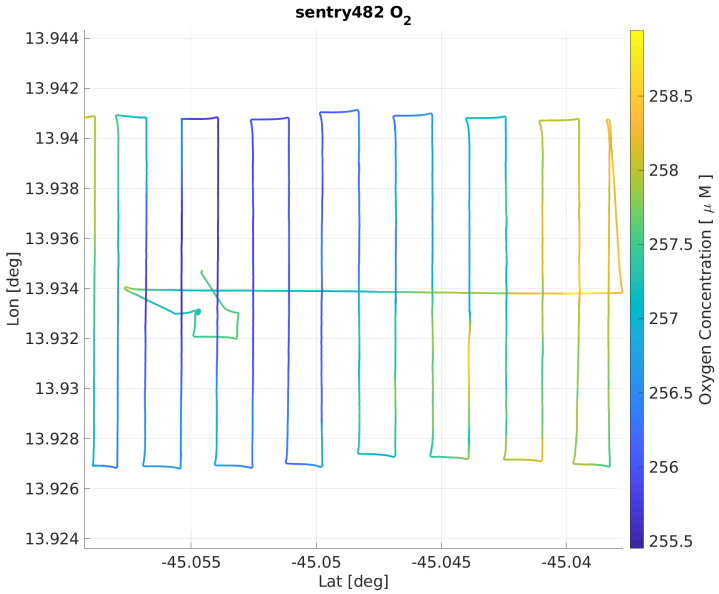


Figure 99: Navigated optode sensor data.

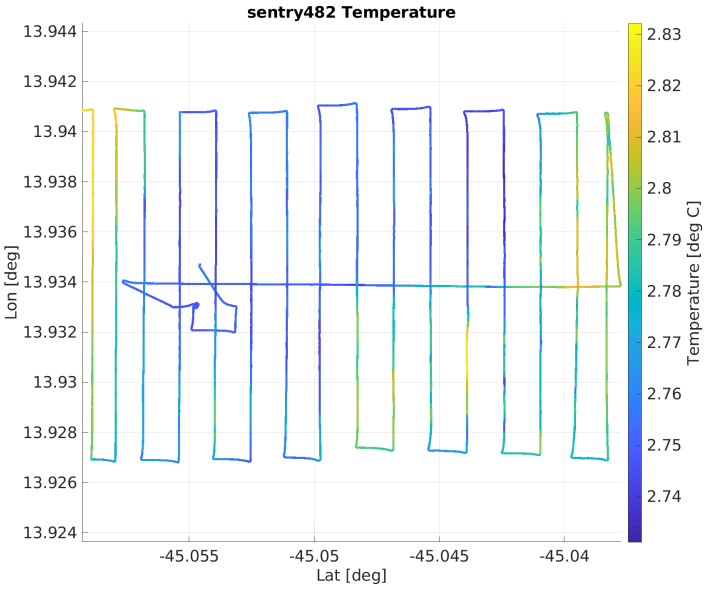
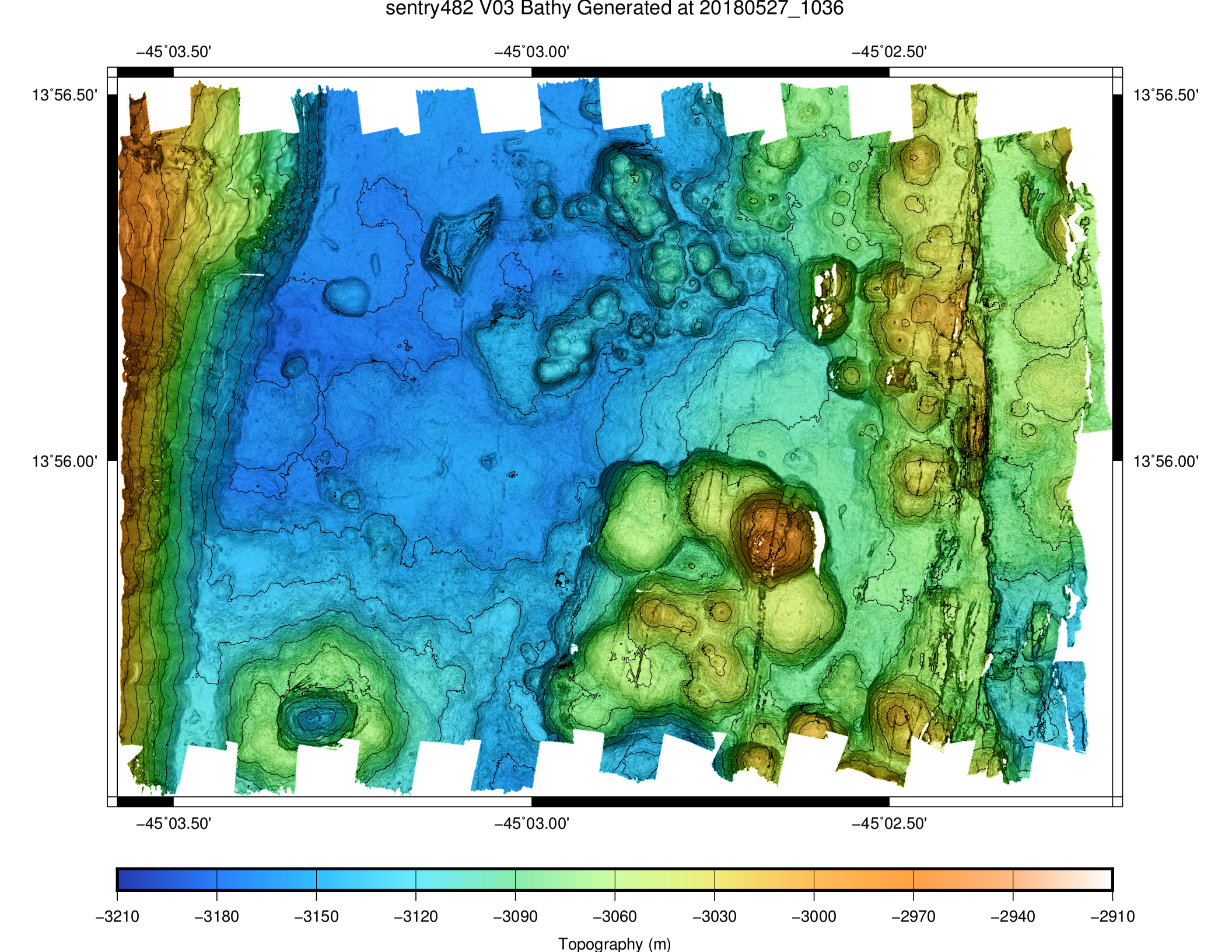


Figure 100: Navigated temperature sensor data


sentry482 V03 Bathy Generated at 20180527_1036
−45˚03.50'
−45˚03.00'
−45˚02.50'
13˚56.50'
13˚56.00'
−3210
−3180
−3150
−3120
−3090
−3060
−3030
−3000
−2970
−2940
−2910
Topography (m)

Sentry 483 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry483 launch position: 13 48.690'N 045 1.600'W

Narrative

Sentry483 was the eleventh dive of the cruise and the second dive at the core complex. This dive covered an area of 1.5km tall by 2km wide west of the sentry479 survey. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:45 local and began its descent to 3000m. Overall this dive went well, covering slightly less than subsequent dives due to the difficult terrain. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Issues

- Thruster: Starboard forward thruster showed signs of water intrusion on the post dive and was swapped out for a spare thruster. This had no impact on the dive..

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.21 sentry483 Summary

sentry483 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/27 20:49:26
Survey start: 2018/05/27 22:17:34
Survey start: Lat:13.814321 Lon:-45.028012
Survey start: Lat:13 48.859'N Lon:045 1.681'W
Survey end: 2018/05/28 06:59:12
Survey end: Lat:13.811936 Lon:-45.023531
Survey end: Lat:13 48.716'N Lon:045 1.412'W
Ascent begins: 2018/05/28 06:59:12
On the surface: 2018/05/28 08:05:36
On deck: 2018/05/28 08:20:34
descent rate: 38.6 m/min
ascent rate: 52.3 m/min
survey time: 8.7 hours
deck-to-deck time 11.5 hours
Min survey depth: 3184m
Max survey depth: 3583m
Mean survey depth: 3441m
Mean survey height: 82m
distance travelled: 29.16km
average speed: 0.92m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.92 m/s over 29.16 km
total vertical during survey: 7289m
Battery energy at launch: 20.7 kwhr
Battery energy at survey start: 20.0 kwhr
Battery energy at survey end: 11.4 kwhr
Battery energy on surface: 11.2 kwhr
Battery energy on deck: 11.1 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry483/nav-sci/proc directory within the sentry483_config matlab structure as well as in ascii text logs in sentry483/metadata. At present metadata is not yet automatically collected on all sensors.

0.22 sentry483 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180527_1809.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180527_1810.cfg`
CTD	SBE 49	260		`sbe49_20180527_1811.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180527_1810.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

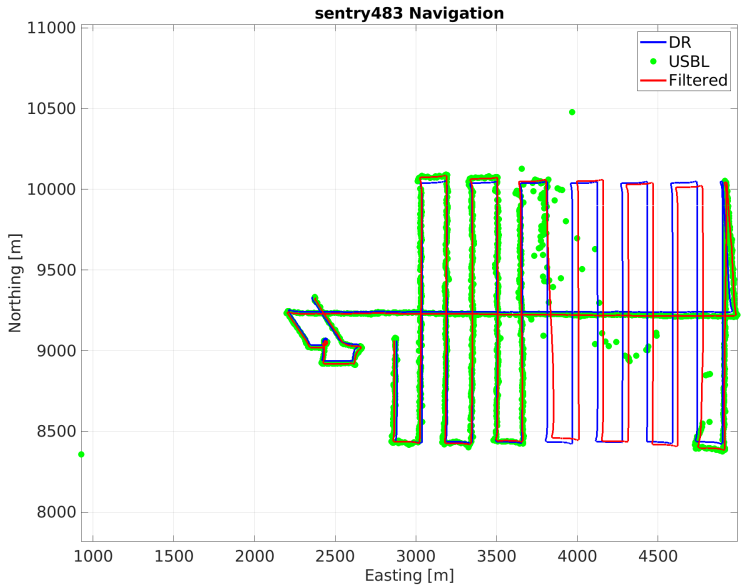


Figure 101: Latitude/Longitude plot of Sentry dive 483 based on post-processed navigation

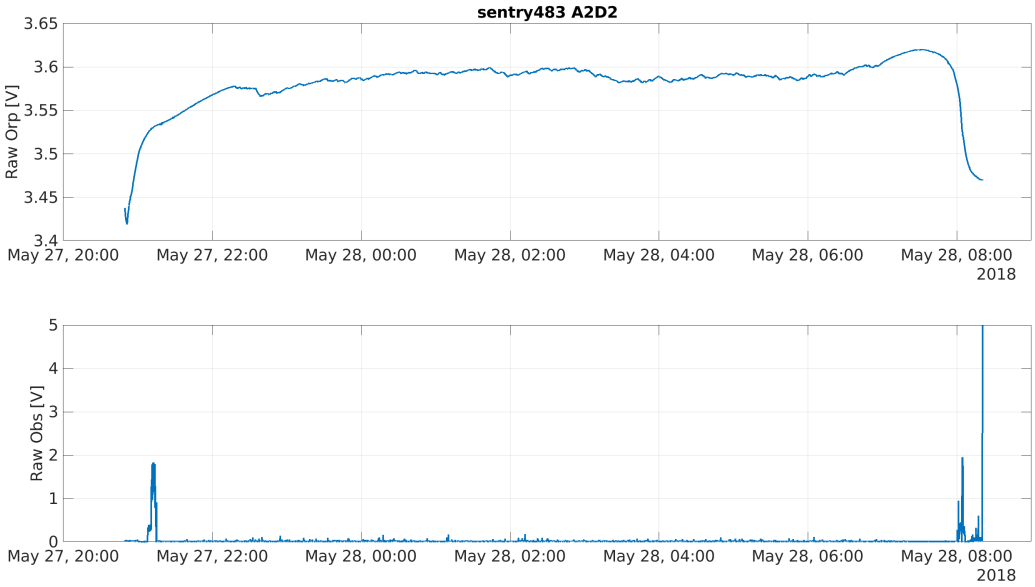


Figure 102: Raw analog Sensor Data

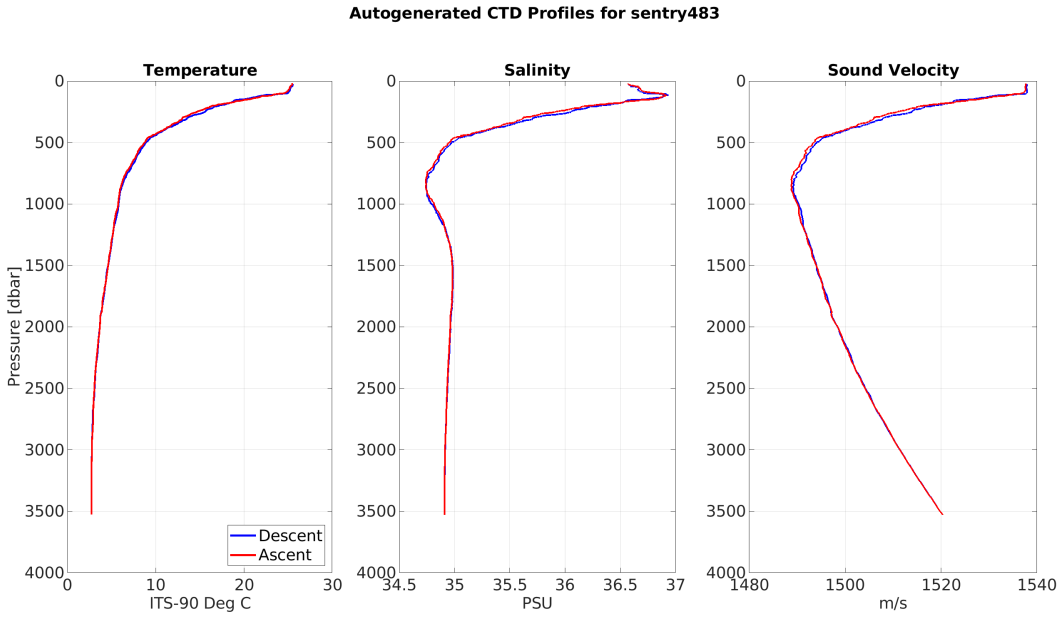


Figure 103: CTD profile sensor data

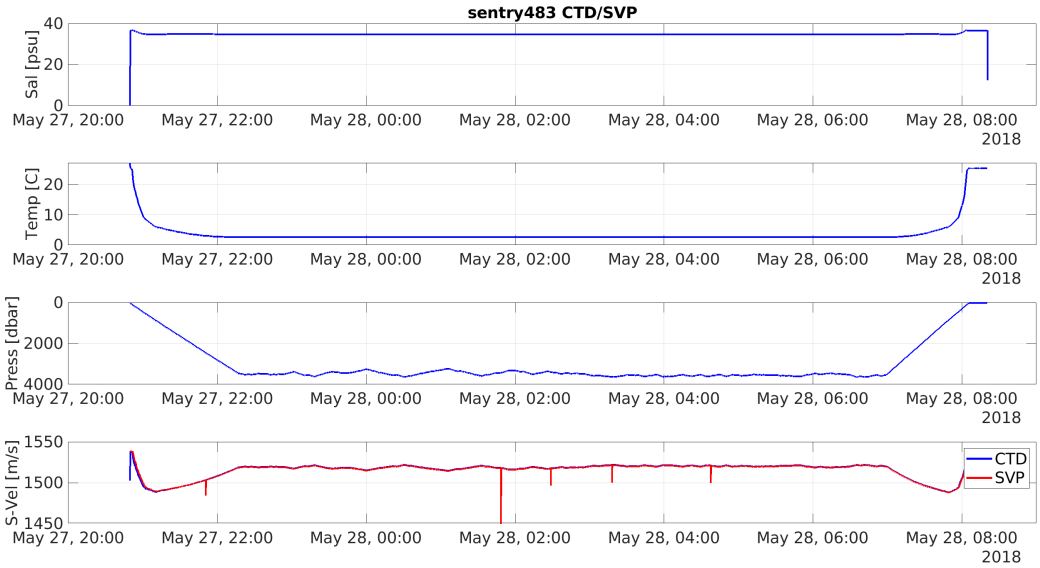


Figure 104: CTD and SVP sensor data

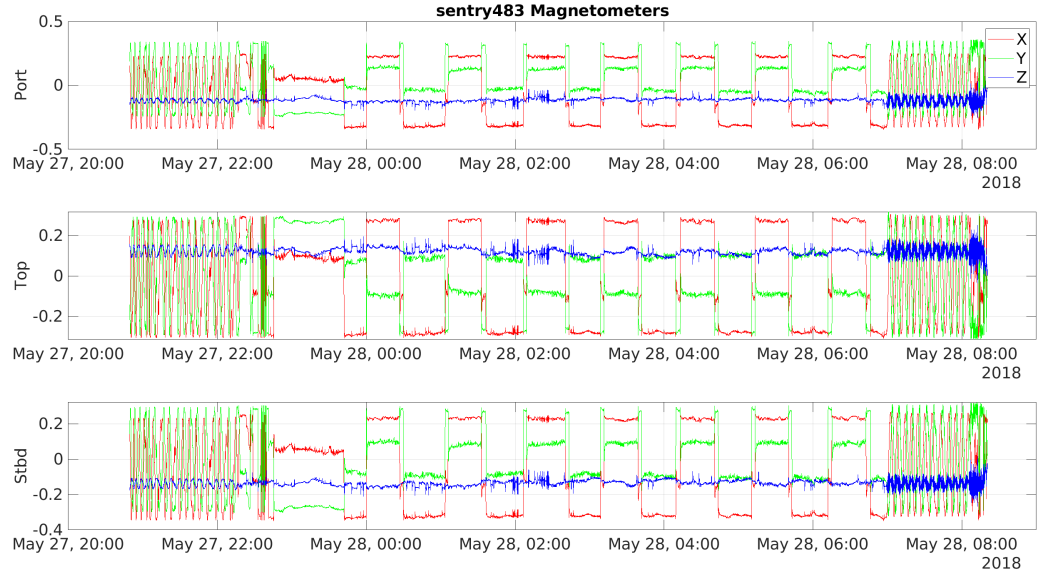


Figure 105: Magnetometer data from each of the three magnetometers on Sentry

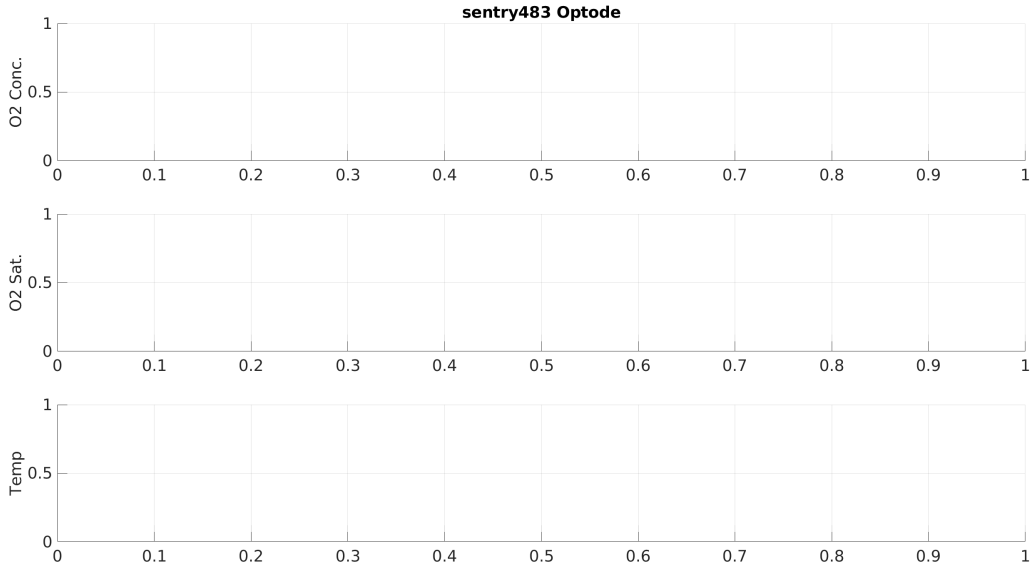


Figure 106: Optode temperature, O2 saturation, and concentration

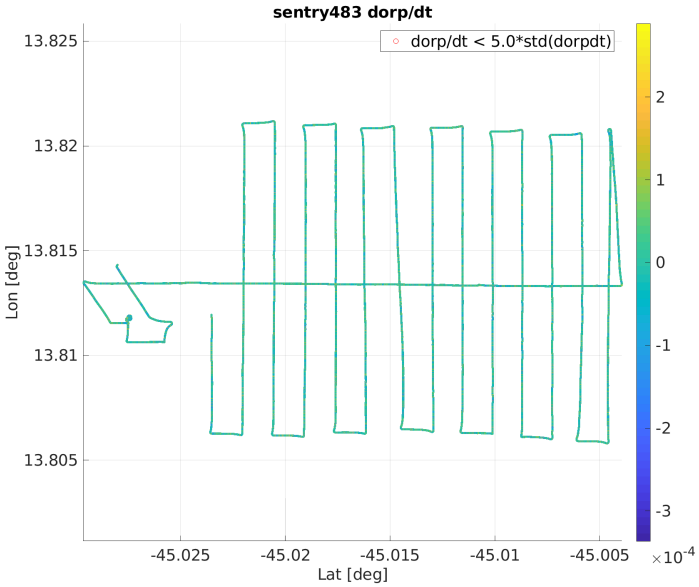


Figure 107: Navigated ORP sensor data.

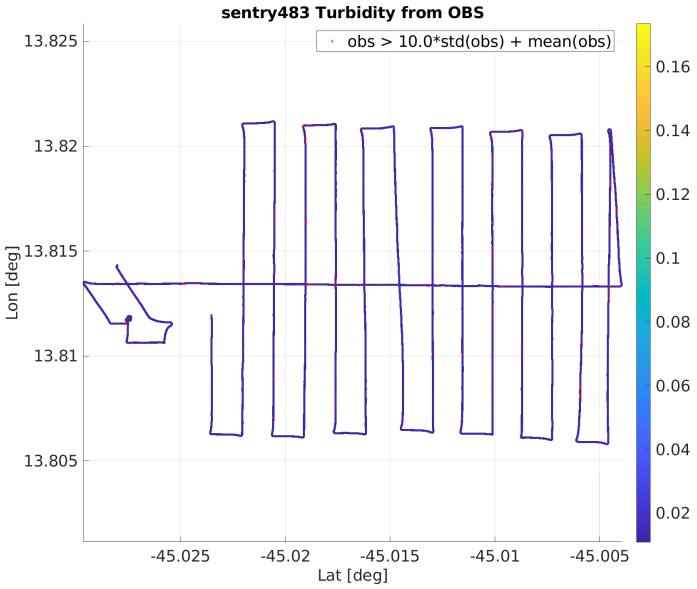


Figure 108: Navigated OBS sensor data.

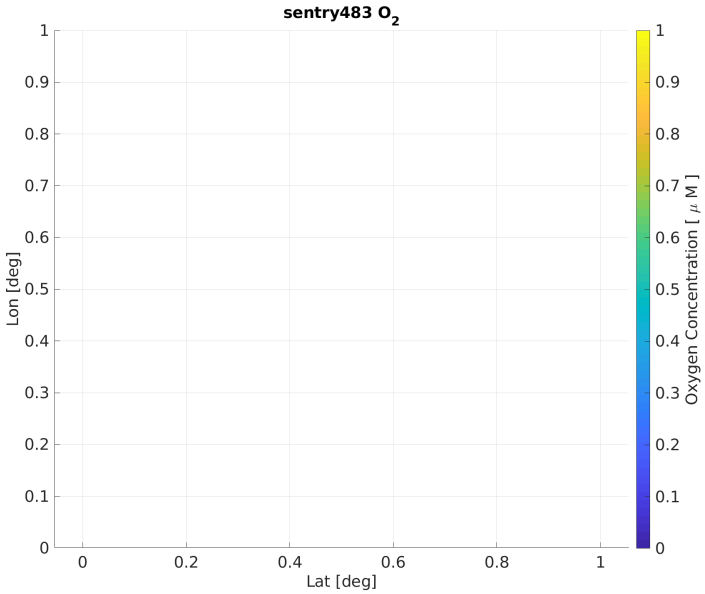


Figure 109: Navigated optode sensor data.

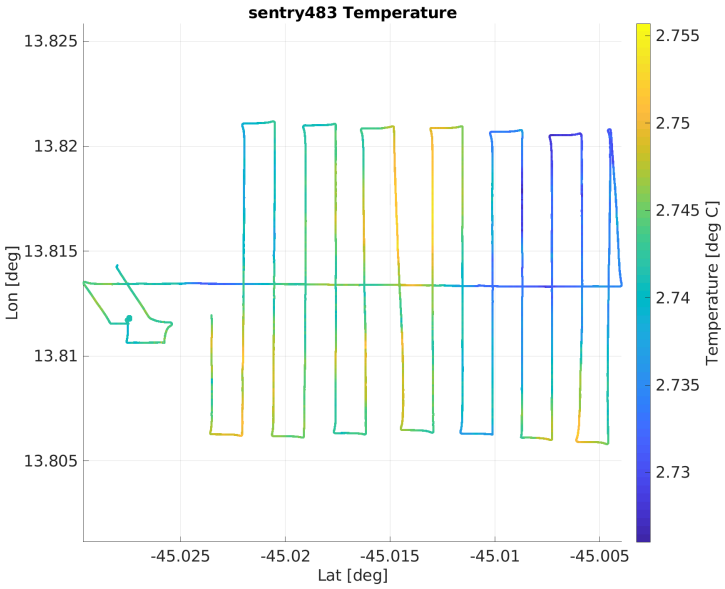
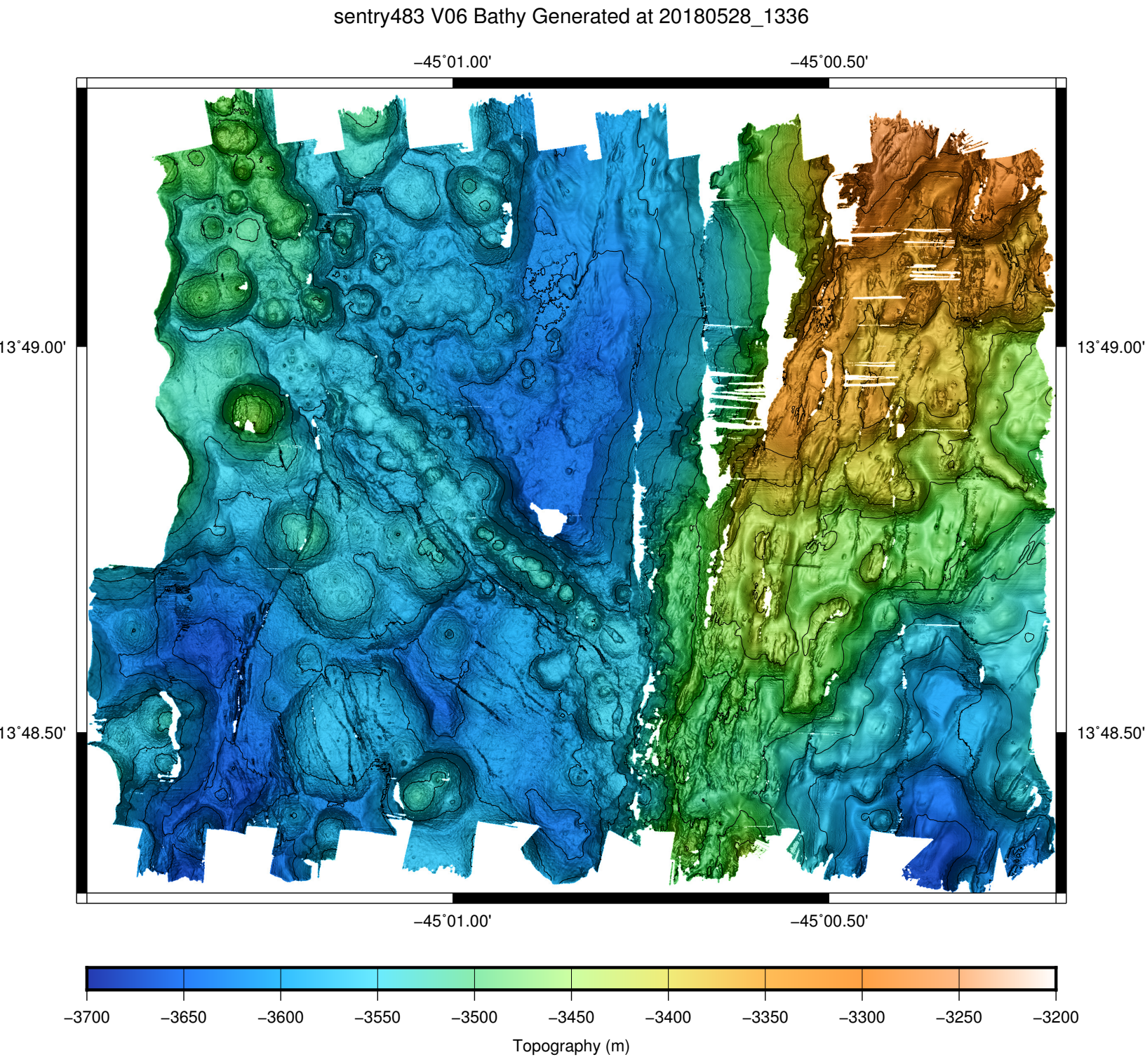


Figure 110: Navigated temperature sensor data


sentry483 V06 Bathy Generated at 20180528_1336
−45˚01.00'
−45˚00.50'
13˚49.00'
13˚48.50'
−3700
−3650
−3600
−3550
−3500
−3450
−3400
−3350
−3300
−3250
−3200
Topography (m)

Sentry 484 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry484 launch position: 13 48.700'N 045 2.761'W

Narrative

Sentry484 was the twelve dive of the cruise and the fourth dive at the core complex. This dive covered an area of 1.5km tall by 1.6km wide, west of the sentry483 survey. Slightly less area was covered during this dive due to an early recovery to allow for an on time Alvin dive.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:45 local and began its descent to 3500m. Once the crossing line and first line of the survey were complete, Atlantis left the work site to perform a gravity core. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.23 sentry484 Summary

sentry484 Summary
Origin: 13.730000 -45.050000
Origin: 13 43.800'N 045 3.000'W
Launch: 2018/05/28 20:29:44
Survey start: 2018/05/28 21:57:40
Survey start: Lat:13.812437 Lon:-45.047190
Survey start: Lat:13 48.746'N Lon:045 2.831'W
Survey end: 2018/05/29 06:04:46
Survey end: Lat:13.818971 Lon:-45.040060
Survey end: Lat:13 49.138'N Lon:045 2.404'W
Ascent begins: 2018/05/29 06:04:46
On the surface: 2018/05/29 07:09:31
On deck: 2018/05/29 07:18:41
descent rate: 39.0 m/min
ascent rate: 52.6 m/min
survey time: 8.1 hours
deck-to-deck time 10.8 hours
Min survey depth: 3273m
Max survey depth: 3571m
Mean survey depth: 3421m
Mean survey height: 84m
distance travelled: 26.50km
average speed: 0.90m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.90 m/s over 26.50 km
total vertical during survey: 6679m
Battery energy at launch: 20.4 kwhr
Battery energy at survey start: 19.8 kwhr
Battery energy at survey end: 11.7 kwhr
Battery energy on surface: 11.6 kwhr
Battery energy on deck: 11.5 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry484/nav-sci/proc directory within the sentry484_config matlab structure as well as in ascii text logs in sentry484/metadata. At present metadata is not yet automatically collected on all sensors.

0.24 sentry484 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180528_1802.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180528_1803.cfg`
CTD	SBE 49	260		`sbe49_20180528_1803.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180528_1803.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

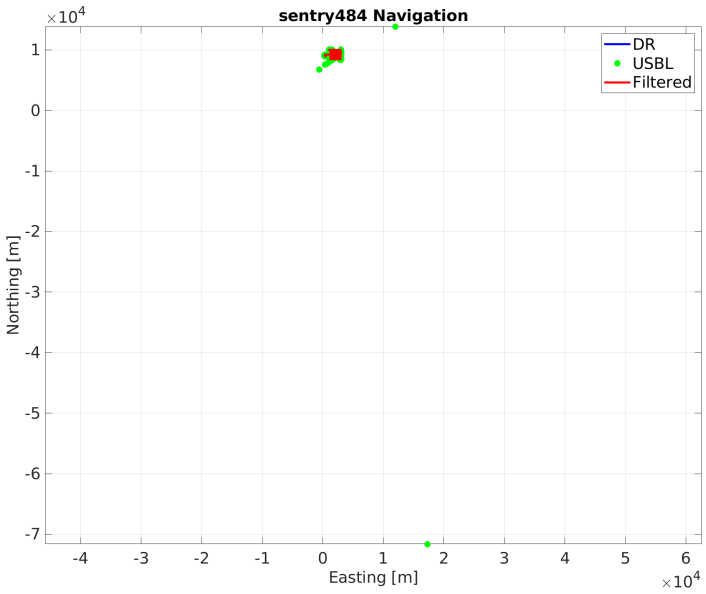


Figure 111: Latitude/Longitude plot of Sentry dive 484 based on post-processed navigation

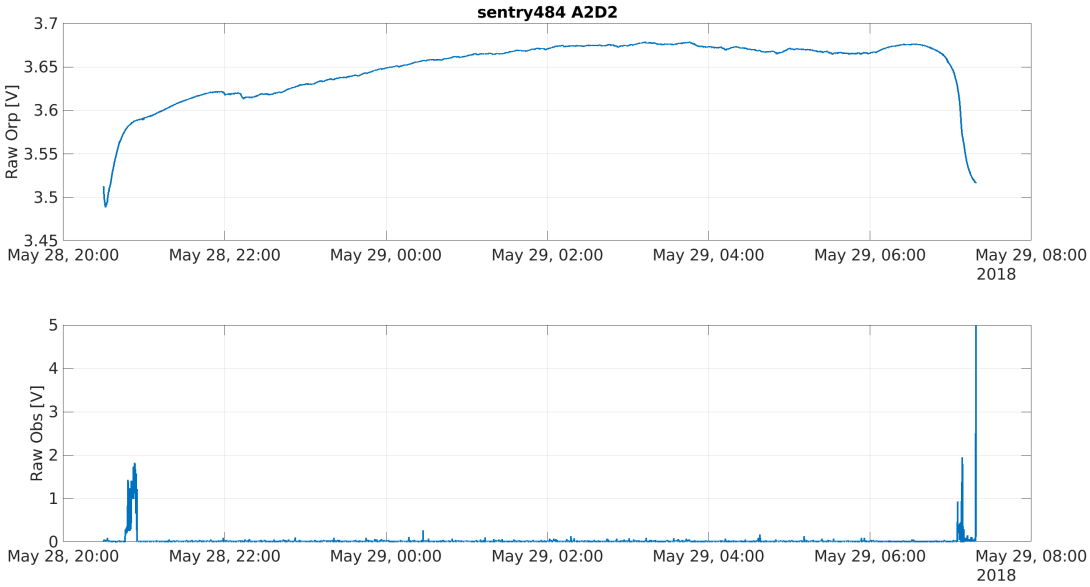


Figure 112: Raw analog Sensor Data

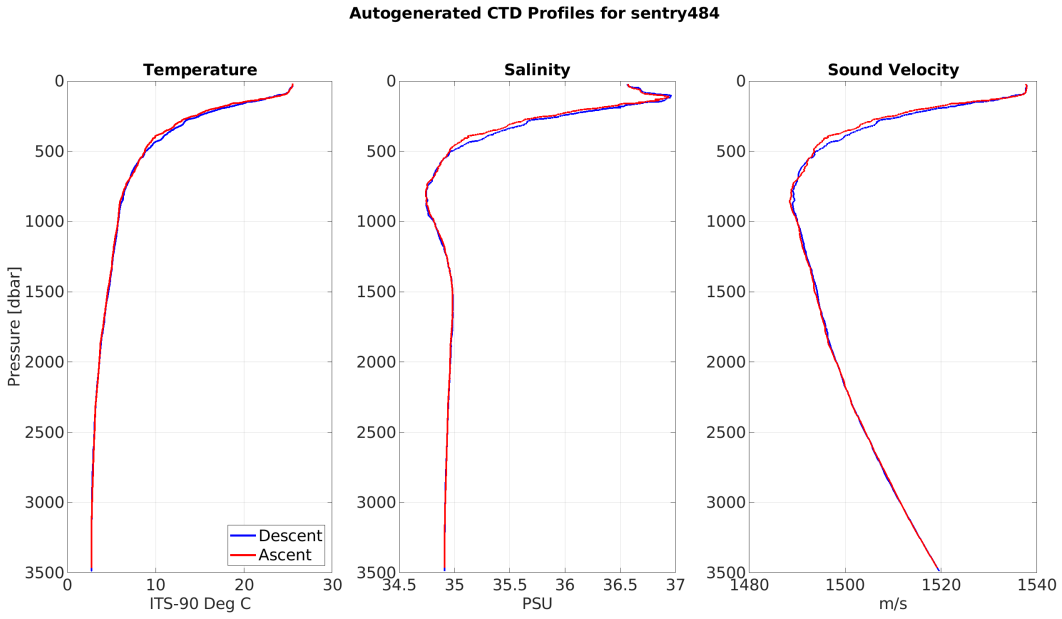


Figure 113: CTD profile sensor data

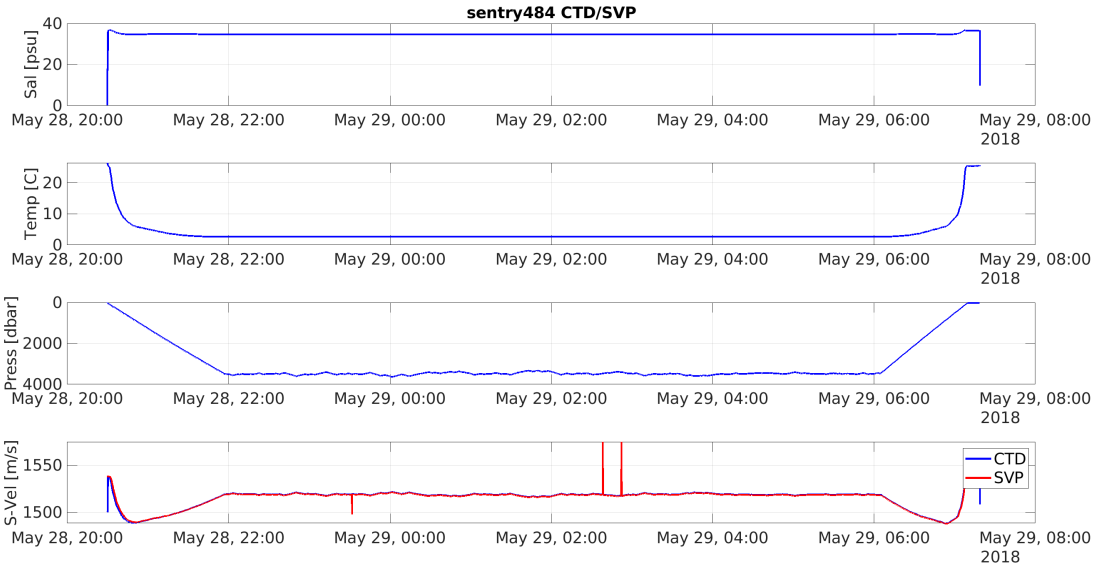


Figure 114: CTD and SVP sensor data

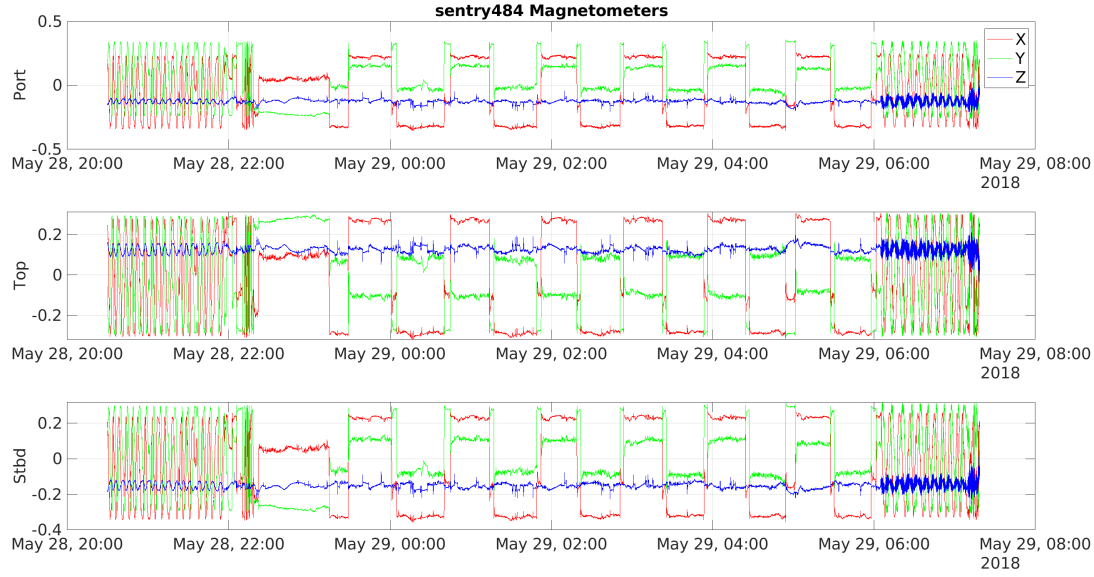


Figure 115: Magnetometer data from each of the three magnetometers on Sentry

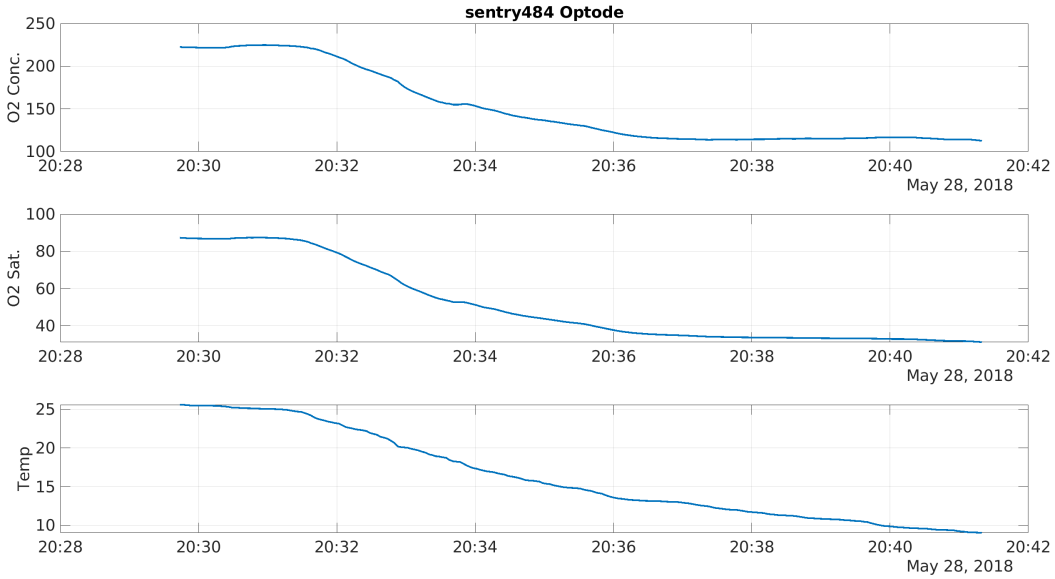


Figure 116: Optode temperature, O2 saturation, and concentration

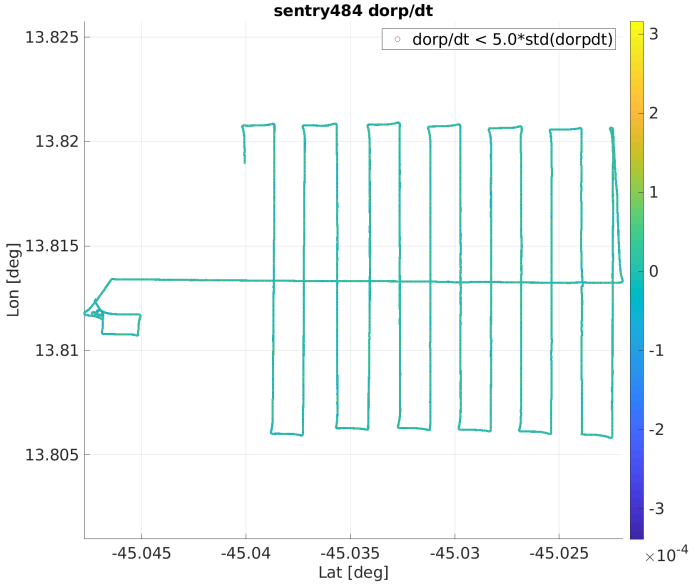


Figure 117: Navigated ORP sensor data.

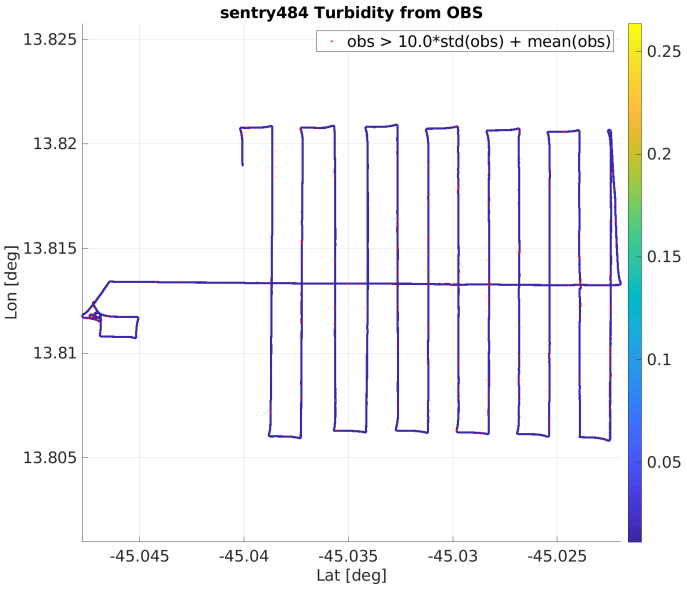


Figure 118: Navigated OBS sensor data.

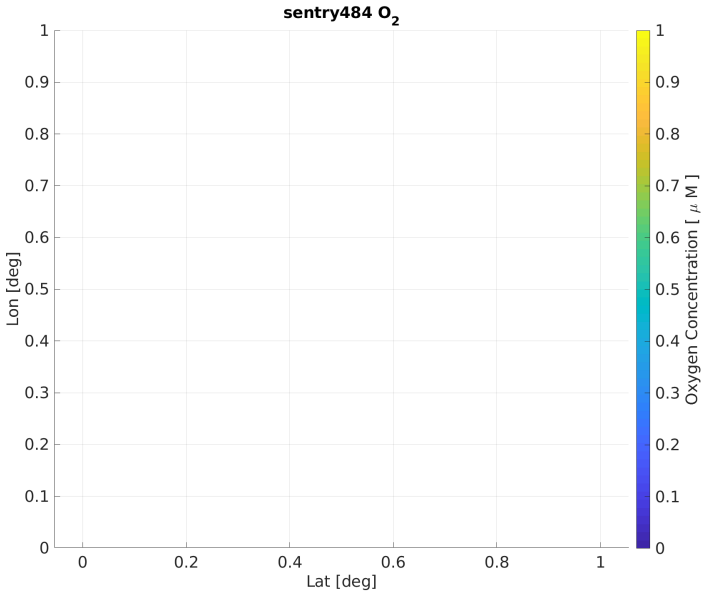


Figure 119: Navigated optode sensor data.

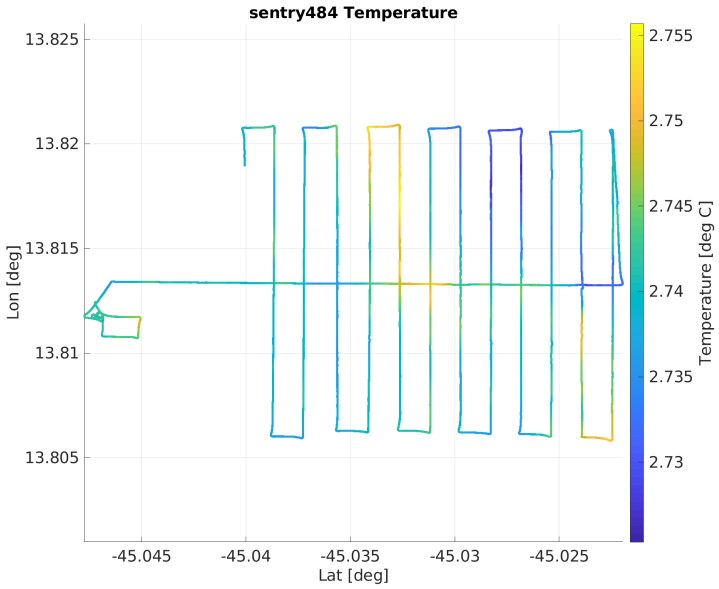
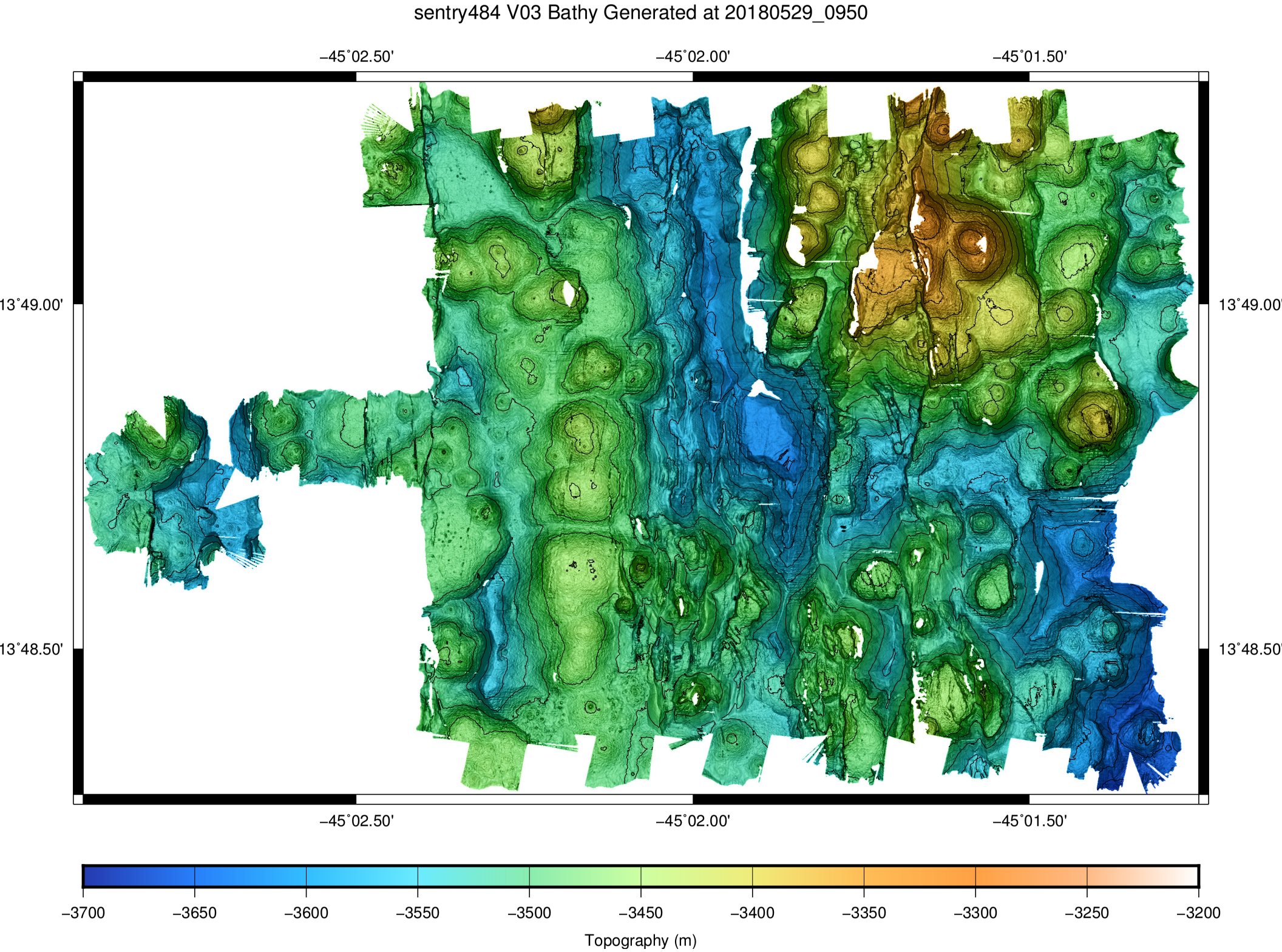


Figure 120: Navigated temperature sensor data


sentry484 V03 Bathy Generated at 20180529_0950
−45˚02.50'
−45˚02.00'
−45˚01.50'
13˚49.00'
13˚48.50'
−3700
−3650
−3600
−3550
−3500
−3450
−3400
−3350
−3300
−3250
−3200
Topography (m)

Sentry 485 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 33 -44 -54

Launch Position: sentry485 launch position: 13 56.950'N 045 2.005'W

Narrative

Sentry485 was the thirteenth dive of the cruise and the first dive at area5. This dive was in a new survey area, with only two alvin dives planned, and a single Sentry dive. This survey looked to cover an area that would be part of the following Alvin Dive. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 18:30 local and began its descent to 3200m. Overall this dive went well, capturing the entire intended survey. No other night ops were performed during the sentry dive. Sentry was manually aborted to ensure an on time arrival for Alvin operations.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.25 sentry485 Summary

sentry485 Summary
Origin: 13.550000 -44.900000
Origin: 13 33.000'N 044 54.000'W
Launch: 2018/05/29 20:29:15
Survey start: 2018/05/29 21:50:26
Survey start: Lat:13.600604 Lon:-44.859247
Survey start: Lat:13 36.036'N Lon:044 51.555'W
Survey end: 2018/05/30 07:17:39
Survey end: Lat:13.585841 Lon:-44.861212
Survey end: Lat:13 35.150'N Lon:044 51.673'W
Ascent begins: 2018/05/30 07:17:39
On the surface: 2018/05/30 08:20:16
On deck: 2018/05/30 08:30:35
descent rate: 38.7 m/min
ascent rate: 52.3 m/min
survey time: 9.5 hours
deck-to-deck time 12.0 hours
Min survey depth: 2914m
Max survey depth: 3331m
Mean survey depth: 3125m
Mean survey height: 82m
distance travelled: 31.14km
average speed: 0.89m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.89 m/s over 31.14 km
total vertical during survey: 7322m
Battery energy at launch: 20.8 kwhr
Battery energy at survey start: 20.2 kwhr
Battery energy at survey end: 11.2 kwhr
Battery energy on surface: 11.0 kwhr
Battery energy on deck: 10.9 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry485/nav-sci/proc directory within the sentry485_config matlab structure as well as in ascii text logs in sentry485/metadata. At present metadata is not yet automatically collected on all sensors.

0.26 sentry485 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180529_1809.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180529_1810.cfg`
CTD	SBE 49	260		`sbe49_20180529_1811.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180529_1810.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

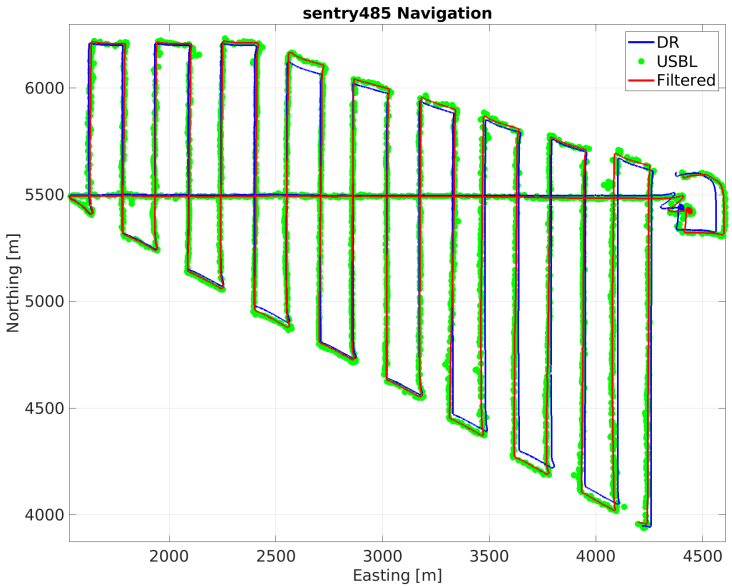


Figure 121: Latitude/Longitude plot of Sentry dive 485 based on post-processed navigation

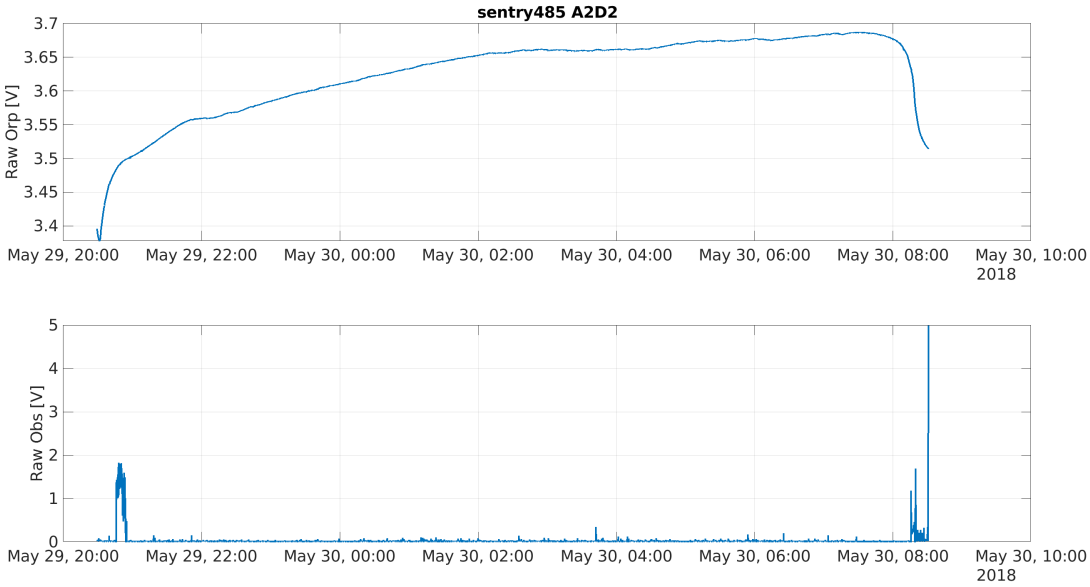


Figure 122: Raw analog Sensor Data

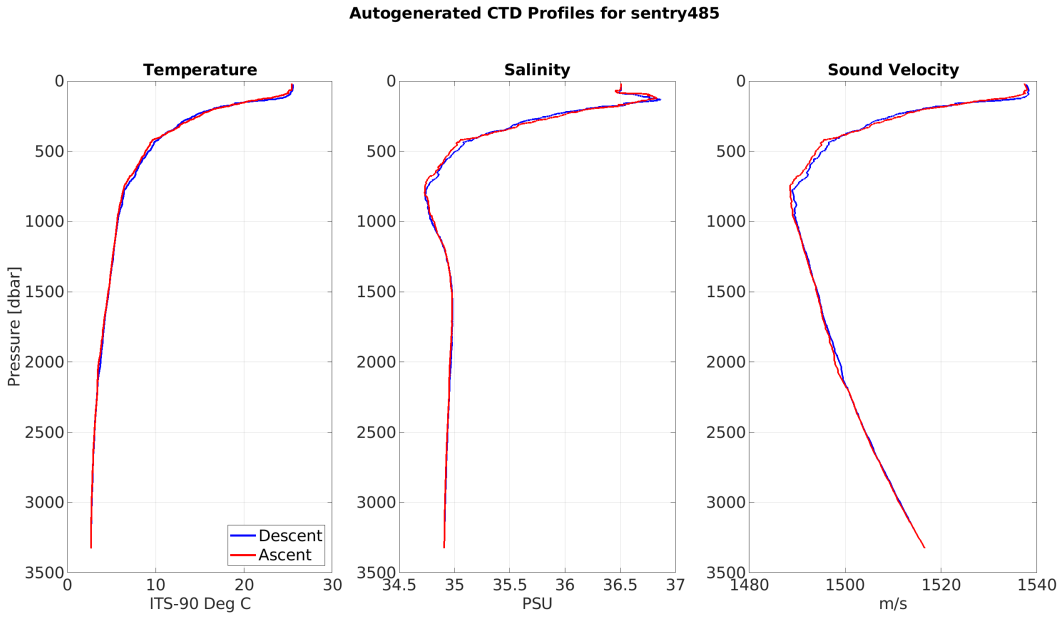


Figure 123: CTD profile sensor data

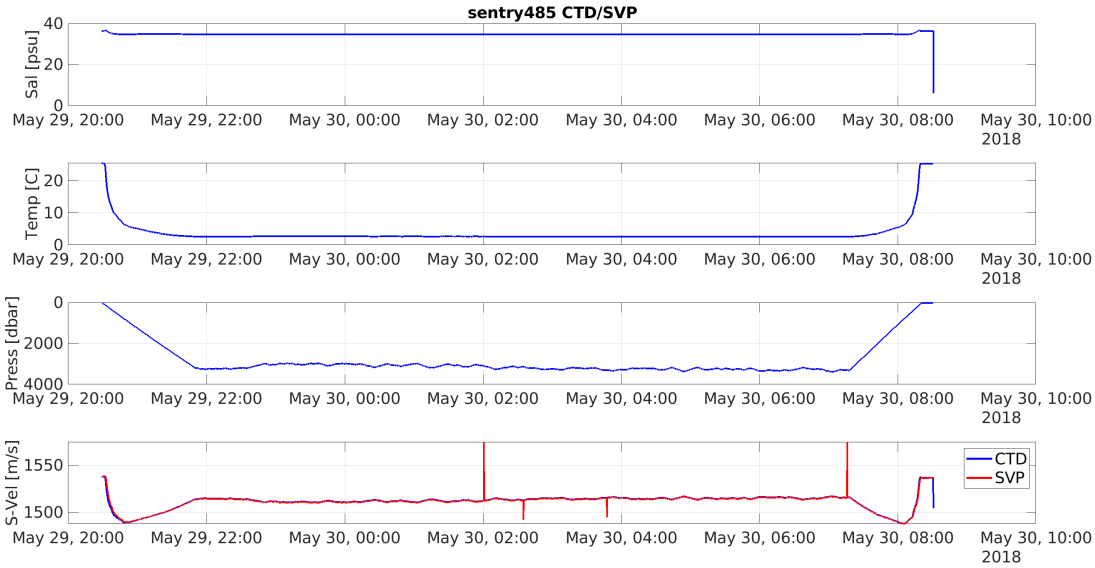


Figure 124: CTD and SVP sensor data

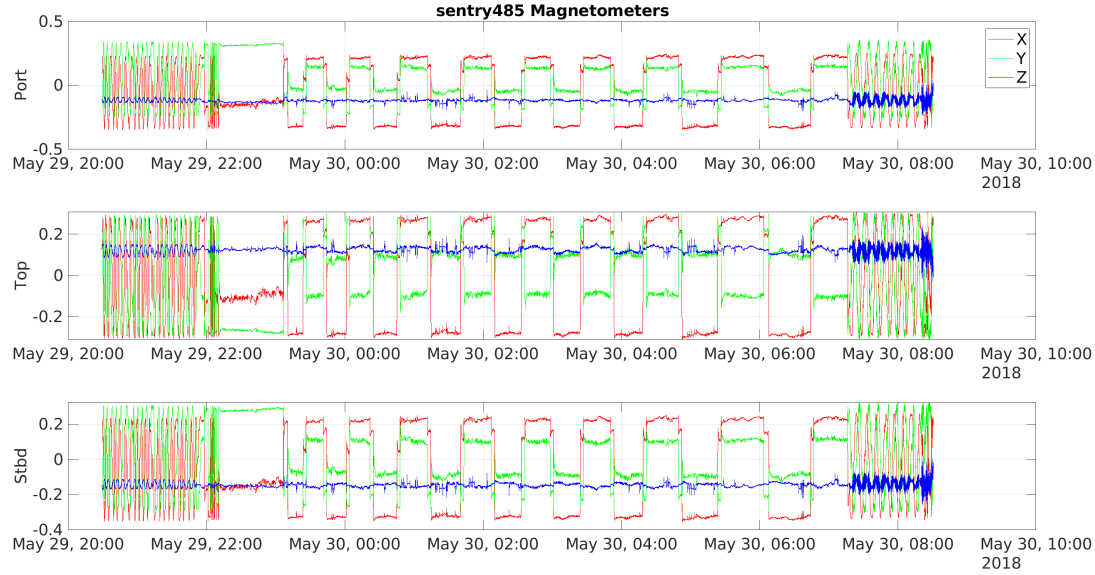


Figure 125: Magnetometer data from each of the three magnetometers on Sentry

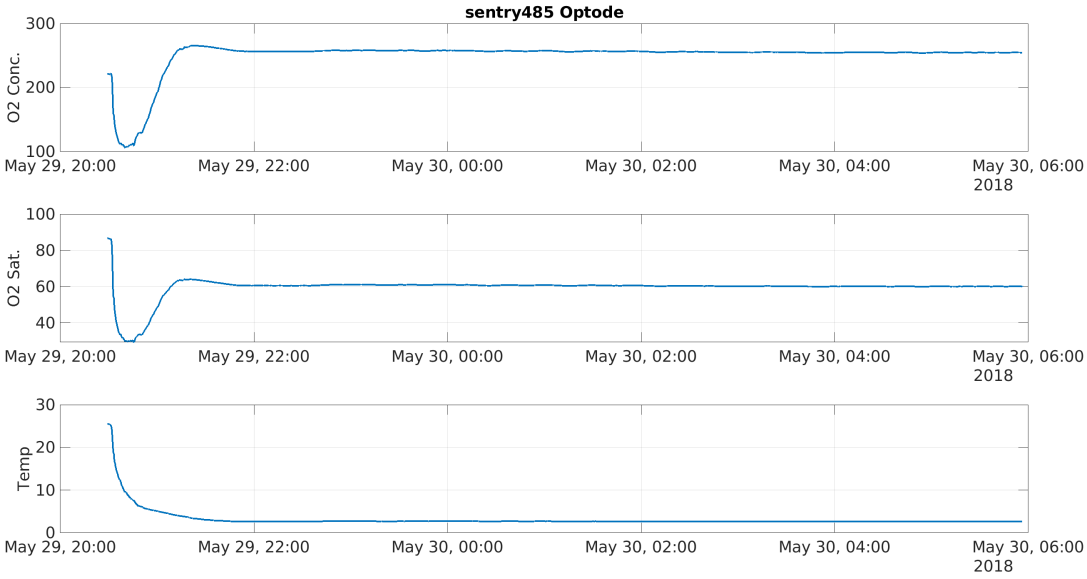


Figure 126: Optode temperature, O2 saturation, and concentration

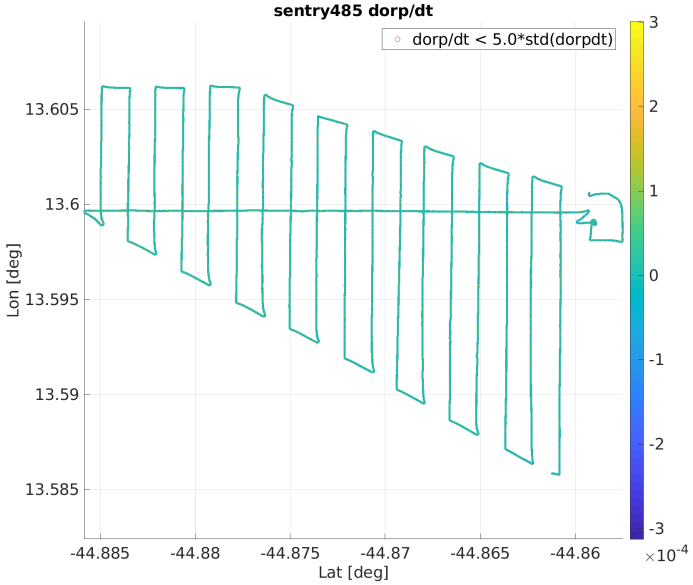


Figure 127: Navigated ORP sensor data.

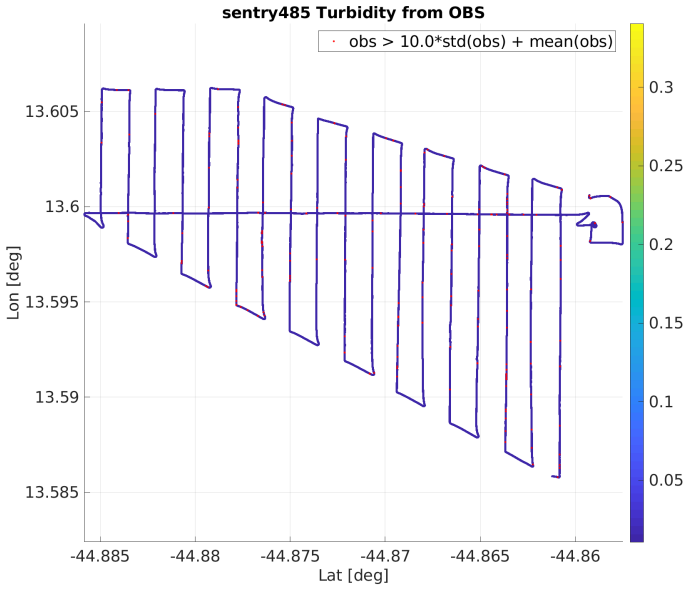


Figure 128: Navigated OBS sensor data.

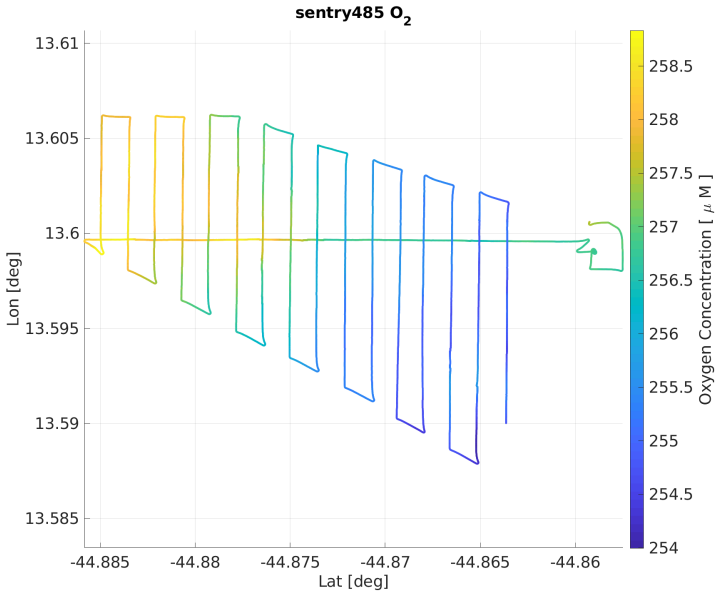


Figure 129: Navigated optode sensor data.

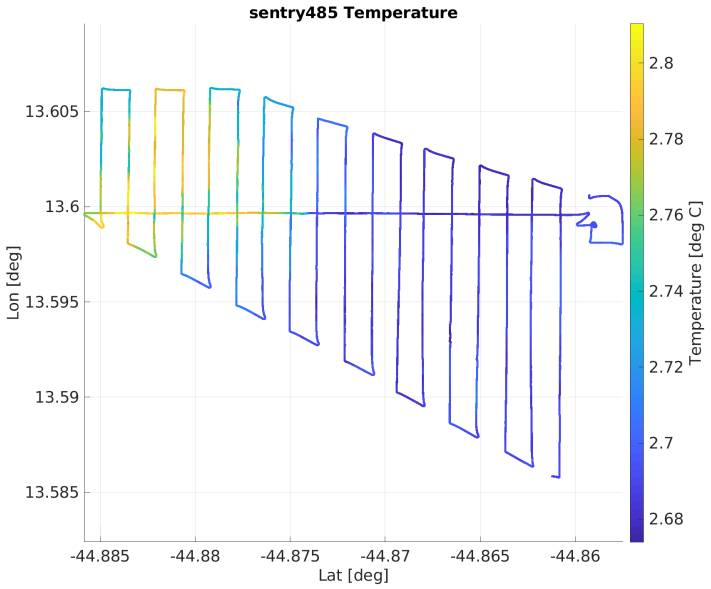
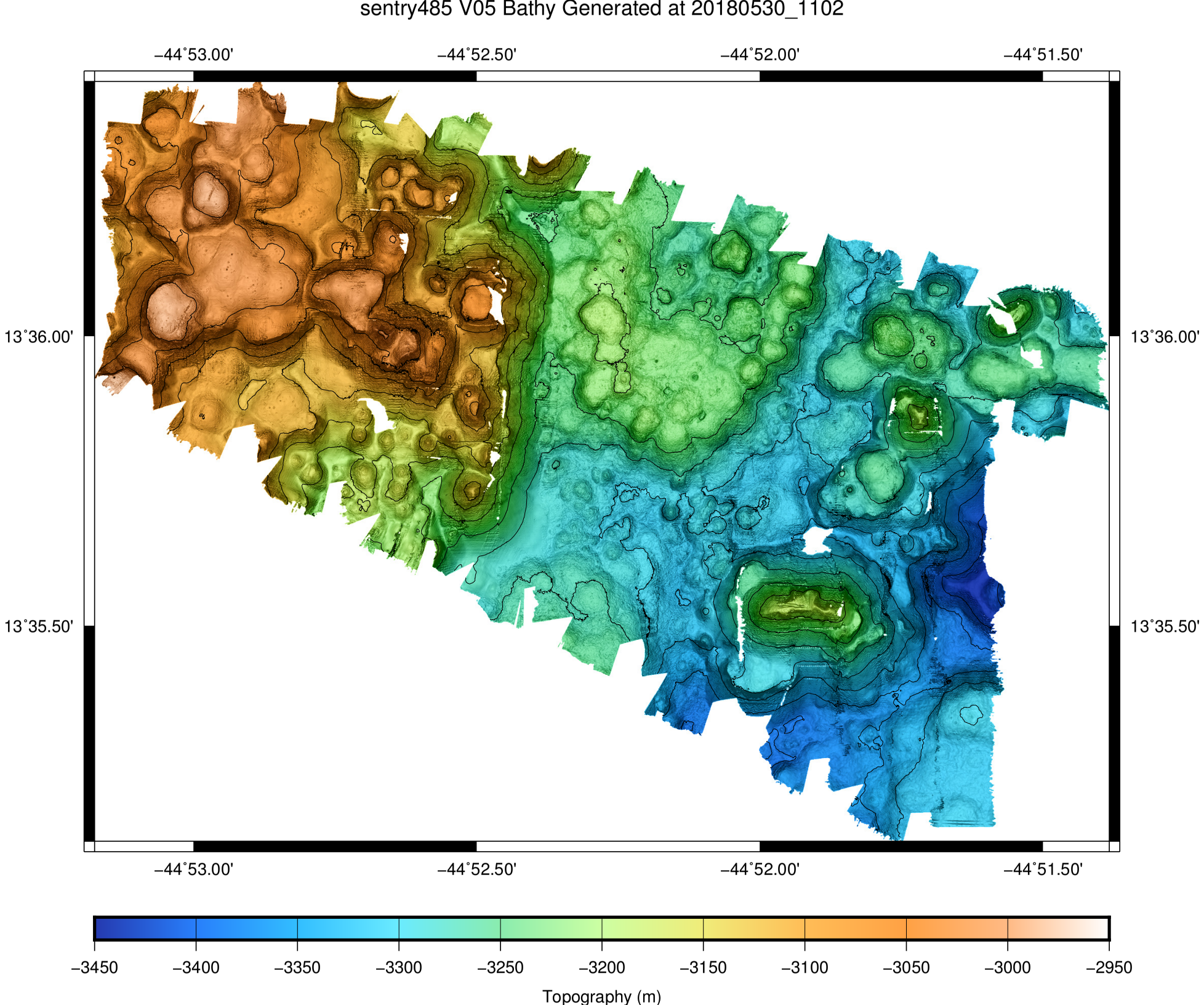


Figure 130: Navigated temperature sensor data


sentry485 V05 Bathy Generated at 20180530_1102
−44˚53.00'
−44˚52.50'
−44˚52.00'
−44˚51.50'
13˚36.00'
13˚35.50'
−3450
−3400
−3350
−3300
−3250
−3200
−3150
−3100
−3050
−3000
−2950
Topography (m)

Sentry 486 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 4 to 5 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 54 -45 -4.5

Launch Position: sentry486 launch position: 13 55.933'N 045 0.060'W

Narrative

Sentry486 was the fourteenth dive of the cruise and the third and final dive at area4. This dive covered an area east of sentry481 surveying 1500m by 2000m in total. Dive time was limited due to a two hour transit before the launch, and an hour transit following the recovery.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 19:45 local following the transit. Overall this dive went well, capturing as much as it could in the little time it had on bottom. A sediment core was completed during the dive, but close enough that USBL tracking was not lost.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.27 sentry486 Summary

sentry486 Summary
Origin: 13.900000 -45.075000
Origin: 13 54.000'N 045 4.500'W
Launch: 2018/05/30 21:41:37
Survey start: 2018/05/30 22:53:51
Survey start: Lat:13.933825 Lon:-45.001475
Survey start: Lat:13 56.030'N Lon:045 0.089'W
Survey end: 2018/05/31 06:56:19
Survey end: Lat:13.933708 Lon:-44.996400
Survey end: Lat:13 56.022'N Lon:044 59.784'W
Ascent begins: 2018/05/31 06:56:19
On the surface: 2018/05/31 07:49:05
On deck: 2018/05/31 07:57:48
descent rate: 39.3 m/min
ascent rate: 52.4 m/min
survey time: 8.0 hours
deck-to-deck time 10.3 hours
Min survey depth: 2748m
Max survey depth: 3105m
Mean survey depth: 2922m
Mean survey height: 79m
distance travelled: 27.60km
average speed: 0.94m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.94 m/s over 27.60 km
total vertical during survey: 5468m
Battery energy at launch: 20.7 kwhr
Battery energy at survey start: 20.1 kwhr
Battery energy at survey end: 12.0 kwhr
Battery energy on surface: 12.0 kwhr
Battery energy on deck: 12.0 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry486/nav-sci/proc directory within the sentry486_config matlab structure as well as in ascii text logs in sentry486/metadata. At present metadata is not yet automatically collected on all sensors.

0.28 sentry486 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180530_1844.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180530_1844.cfg`
CTD	SBE 49	260		`sbe49_20180530_1845.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180530_1844.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

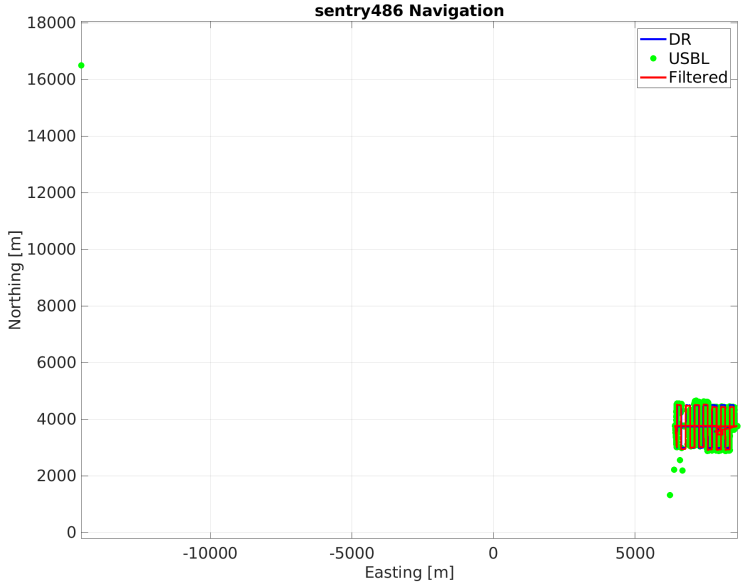


Figure 131: Latitude/Longitude plot of Sentry dive 486 based on post-processed navigation

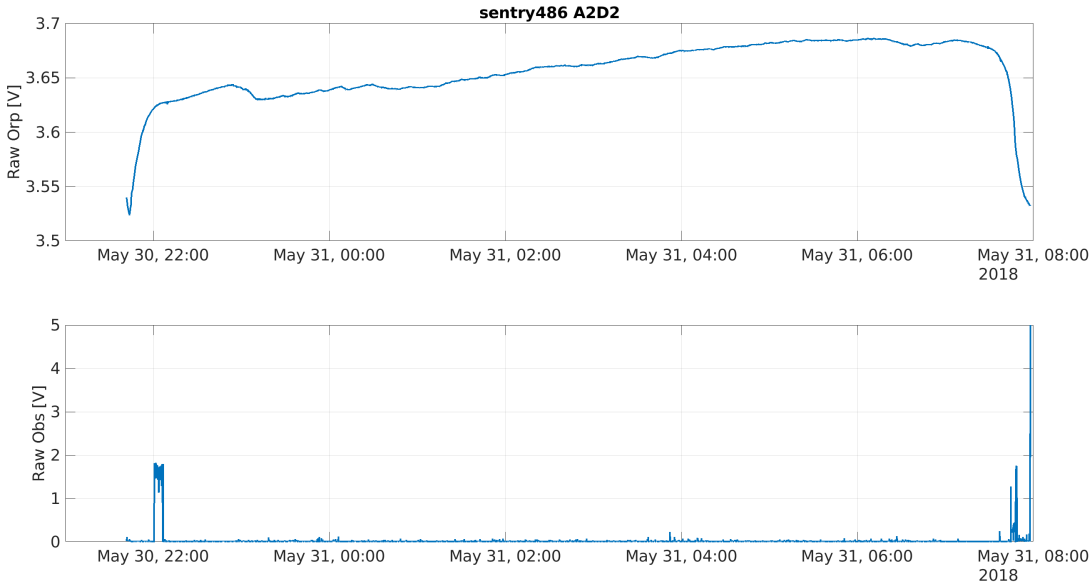


Figure 132: Raw analog Sensor Data

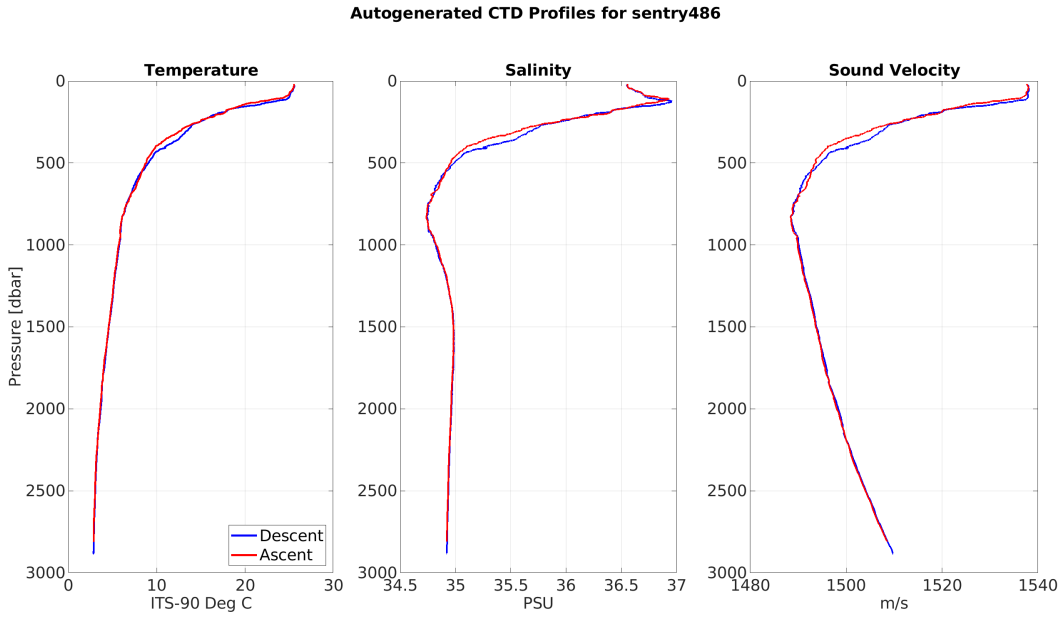


Figure 133: CTD profile sensor data

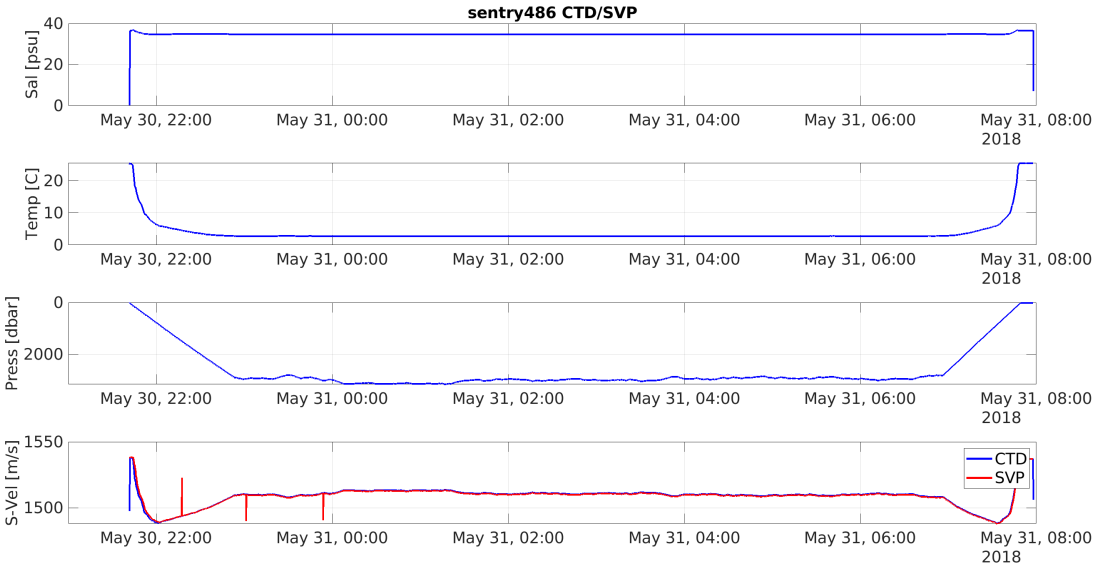


Figure 134: CTD and SVP sensor data

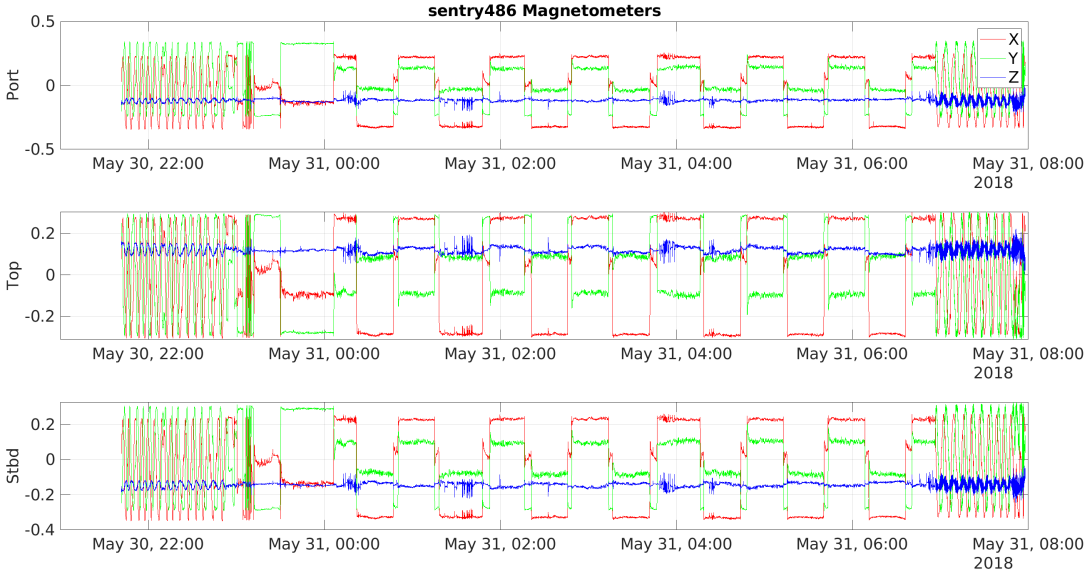


Figure 135: Magnetometer data from each of the three magnetometers on Sentry

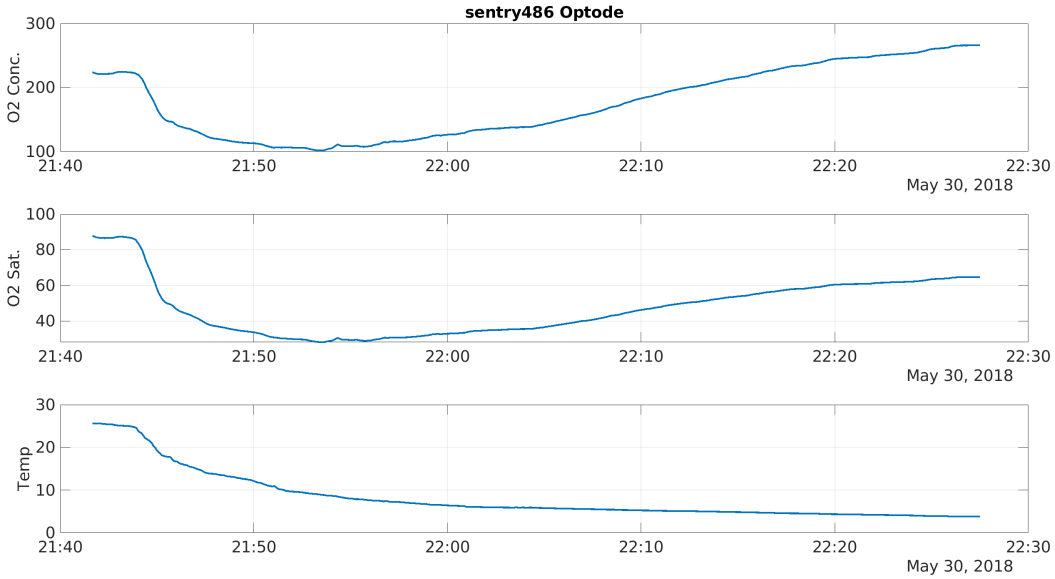


Figure 136: Optode temperature, O2 saturation, and concentration

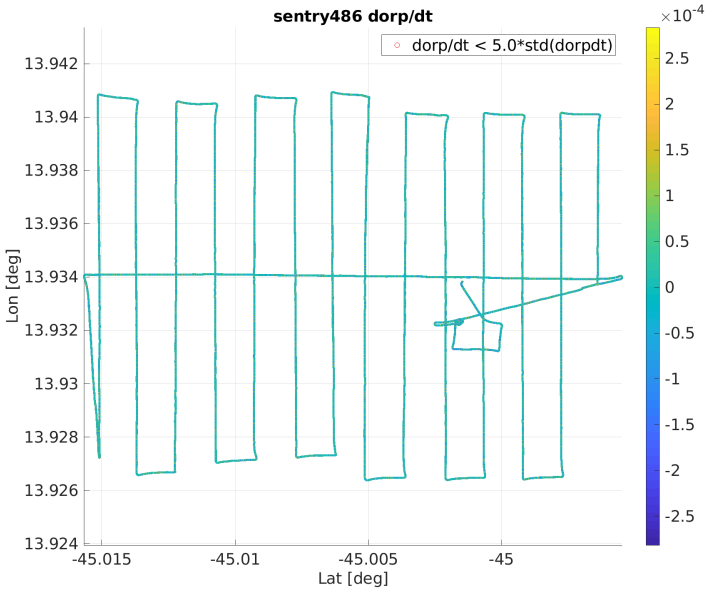


Figure 137: Navigated ORP sensor data.

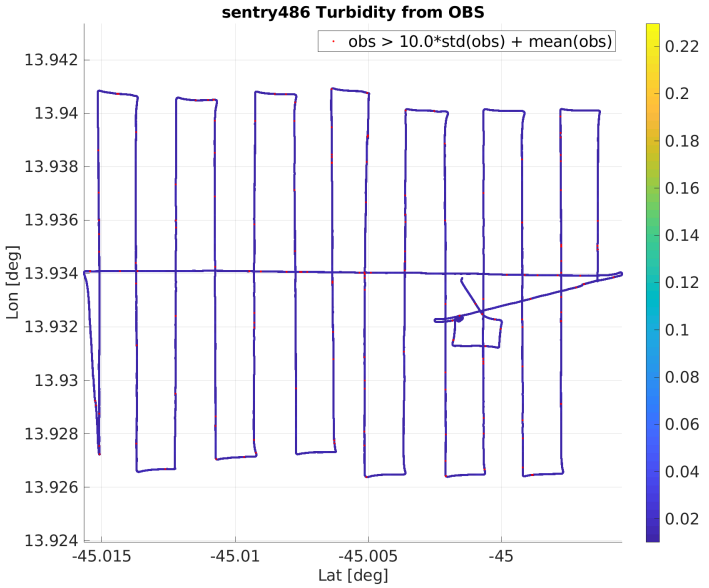


Figure 138: Navigated OBS sensor data.

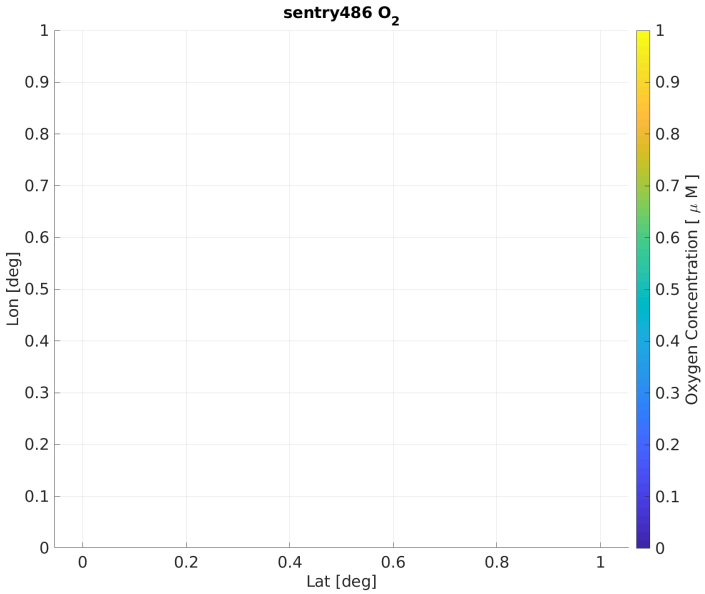


Figure 139: Navigated optode sensor data.

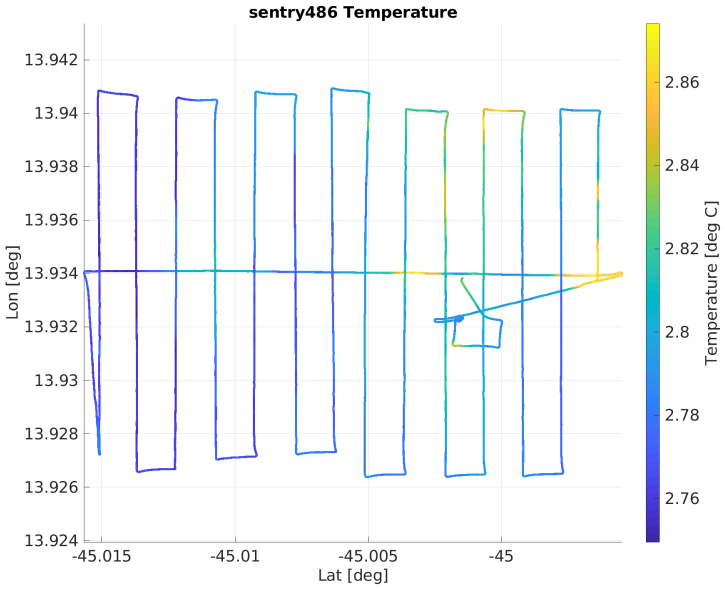
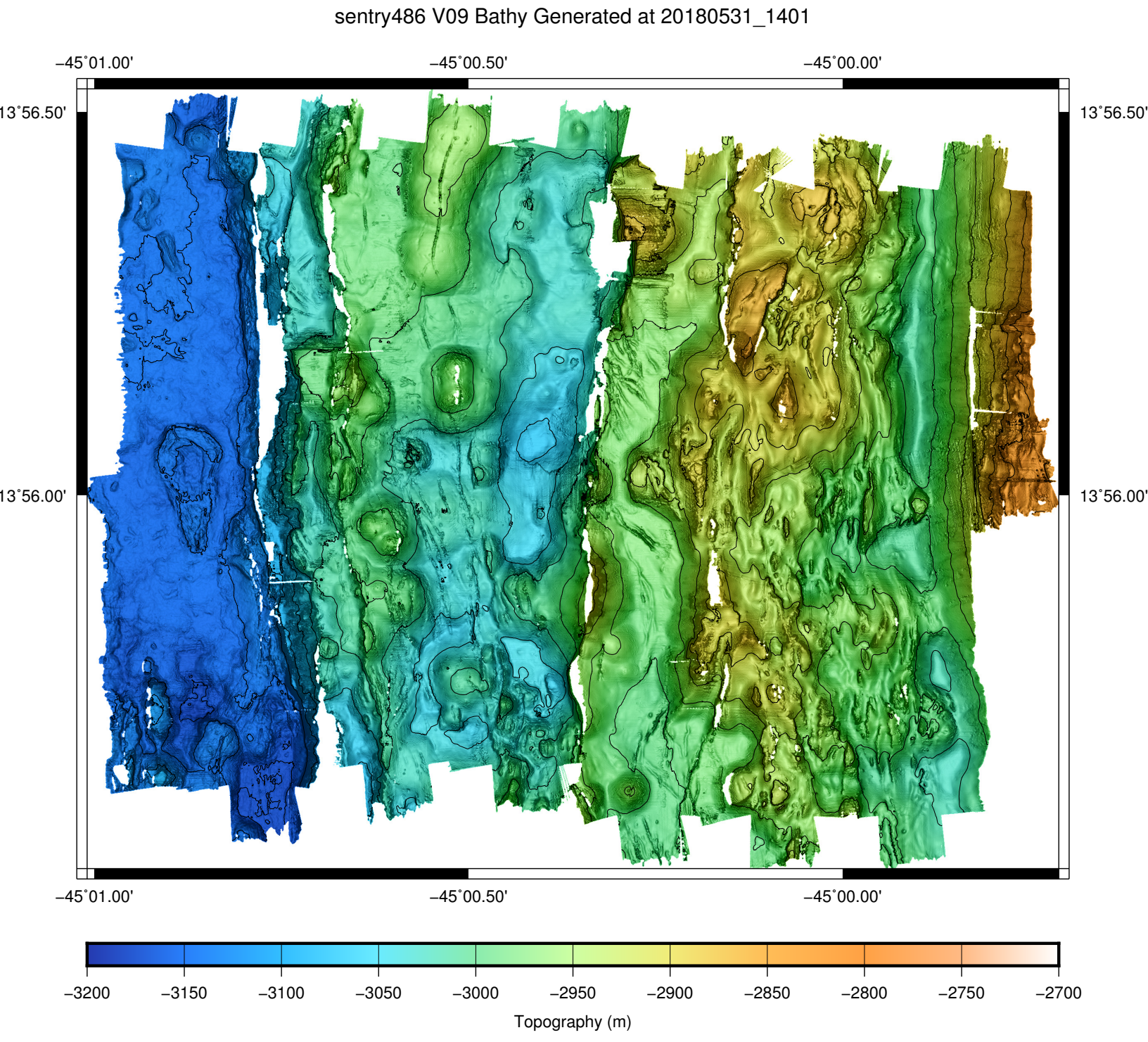


Figure 140: Navigated temperature sensor data


sentry486 V09 Bathy Generated at 20180531_1401
−45˚01.00'
−45˚00.50'
−45˚00.00'
13˚56.50'
13˚56.00'
−3200
−3150
−3100
−3050
−3000
−2950
−2900
−2850
−2800
−2750
−2700
Topography (m)

Sentry 487 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 2 to 3 ft.

Reason for end of dive: Out of time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 14 2 -45 -5

Launch Position: sentry487 launch position: 14 4.495'N 044 59.401'W

Narrative

Sentry487 was the fifteenth dive of the cruise and the first dive at area2. This dive covered additional area east of existing bathy from the 2016 Kurz cruise. Total area covered during the dive was roughly 1500m by 2000m. Dive time was limited due to a two hour transit before the launch.

Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 19:30 local following the transit. Sentry completed most of the expected mission. Terrain was difficult and bottom tracking through the DVL was lost several times during the dive. Due to the difficult terrain, there were several cases where the altitude was to high to maintain adequate multibeam coverage, causing gaps in the multibeam. A sediment core was completed during the dive. The waveglider was recovered once Sentry was in the water.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.29 sentry487 Summary

sentry487 Summary
Origin: 14.033333 -45.083333
Origin: 14 2.000'N 045 5.000'W
Launch: 2018/05/31 21:38:37
Survey start: 2018/05/31 22:43:33
Survey start: Lat:14.075233 Lon:-44.991043
Survey start: Lat:14 4.514'N Lon:044 59.463'W
Survey end: 2018/06/01 07:29:22
Survey end: Lat:14.084384 Lon:-44.987908
Survey end: Lat:14 5.063'N Lon:044 59.274'W
Ascent begins: 2018/06/01 07:29:22
On the surface: 2018/06/01 08:18:19
On deck: 2018/06/01 08:28:30
descent rate: 39.2 m/min
ascent rate: 52.2 m/min
survey time: 8.8 hours
deck-to-deck time 10.8 hours
Min survey depth: 2528m
Max survey depth: 3031m
Mean survey depth: 2818m
Mean survey height: 79m
distance travelled: 28.73km
average speed: 0.88m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.88 m/s over 28.73 km
total vertical during survey: 6865m
Battery energy at launch: 20.7 kwhr
Battery energy at survey start: 20.2 kwhr
Battery energy at survey end: 11.4 kwhr
Battery energy on surface: 11.4 kwhr
Battery energy on deck: 11.2 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry487/nav-sci/proc directory within the sentry487_config matlab structure as well as in ascii text logs in sentry487/metadata. At present metadata is not yet automatically collected on all sensors.

0.30 sentry487 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180531_1848.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180531_1849.cfg`
CTD	SBE 49	260		`sbe49_20180531_1849.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180531_1848.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

Figure 141: Latitude/Longitude plot of Sentry dive 487 based on post-processed navigation

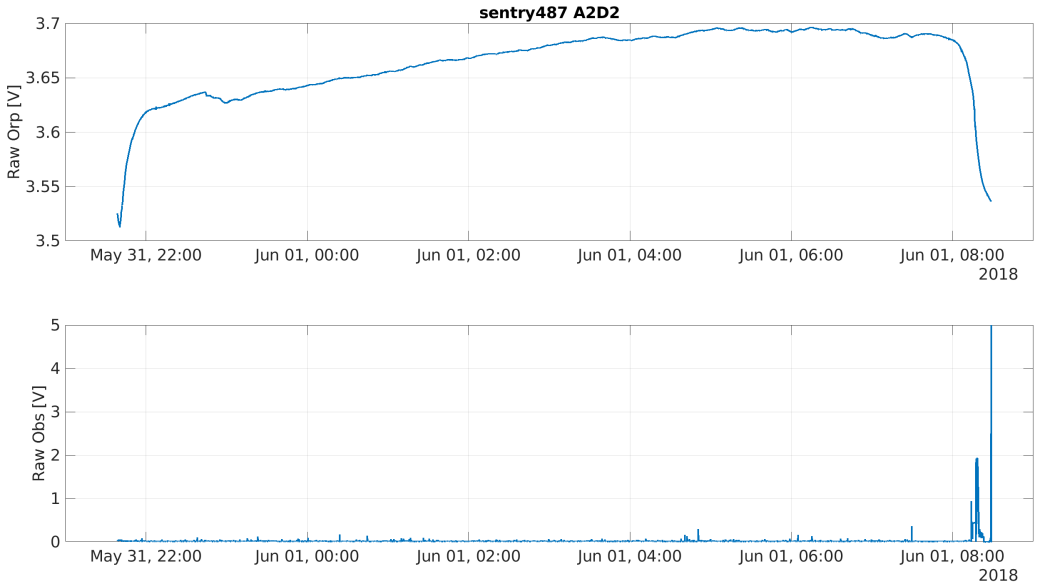


Figure 142: Raw analog Sensor Data

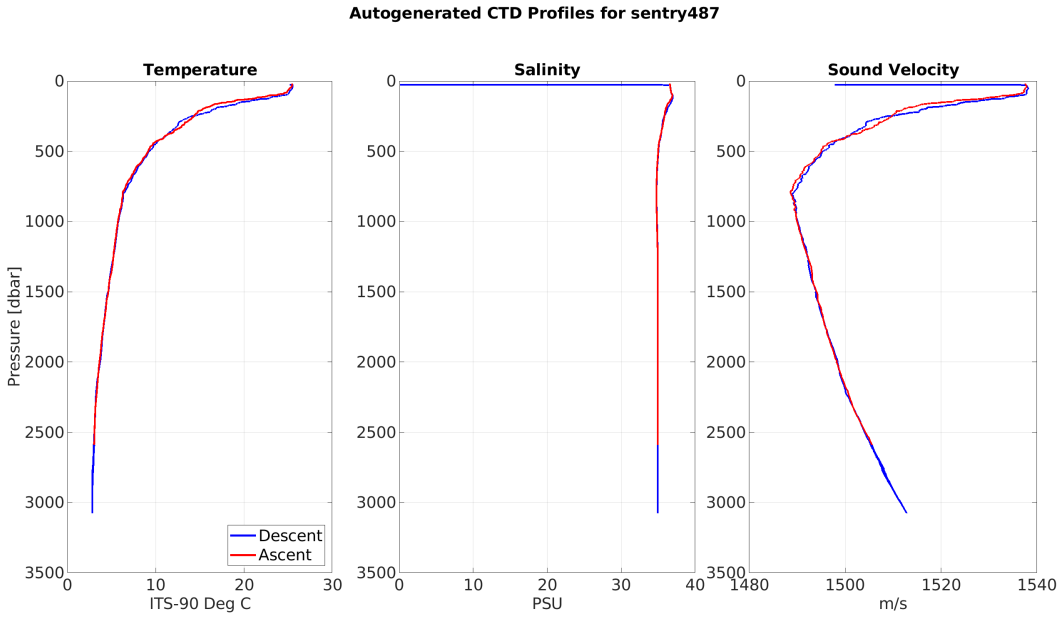


Figure 143: CTD profile sensor data

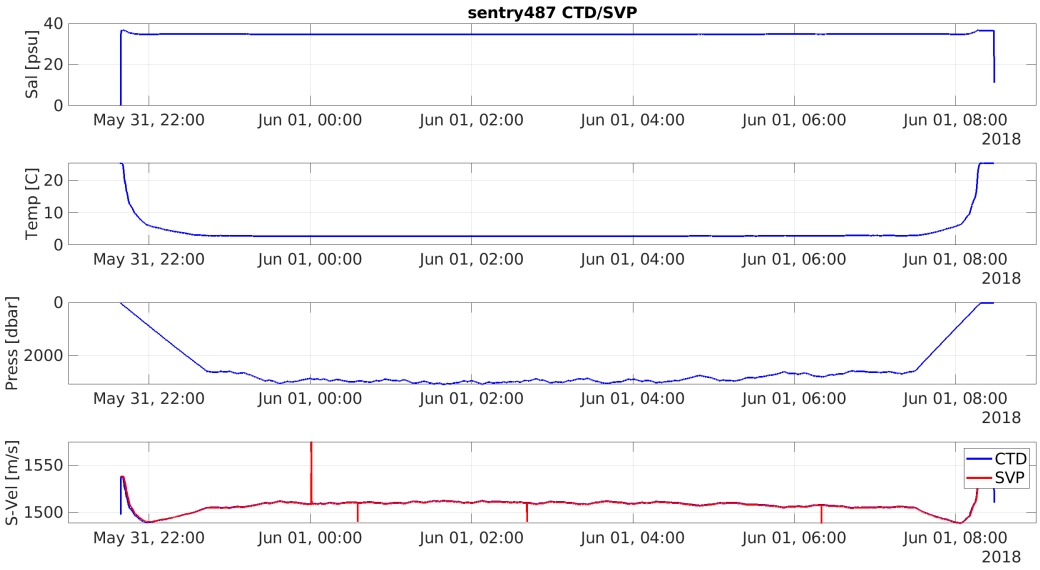


Figure 144: CTD and SVP sensor data

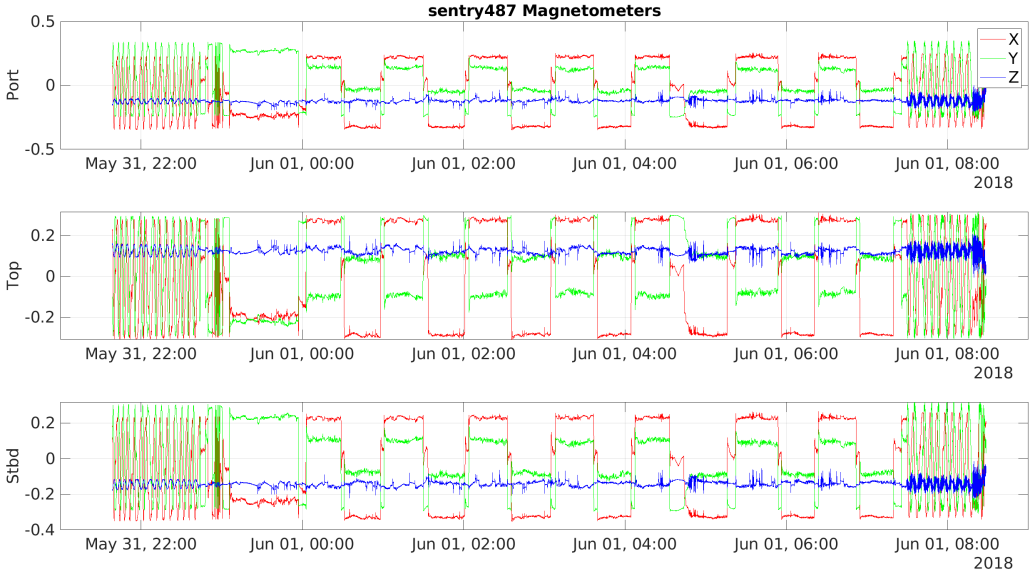


Figure 145: Magnetometer data from each of the three magnetometers on Sentry

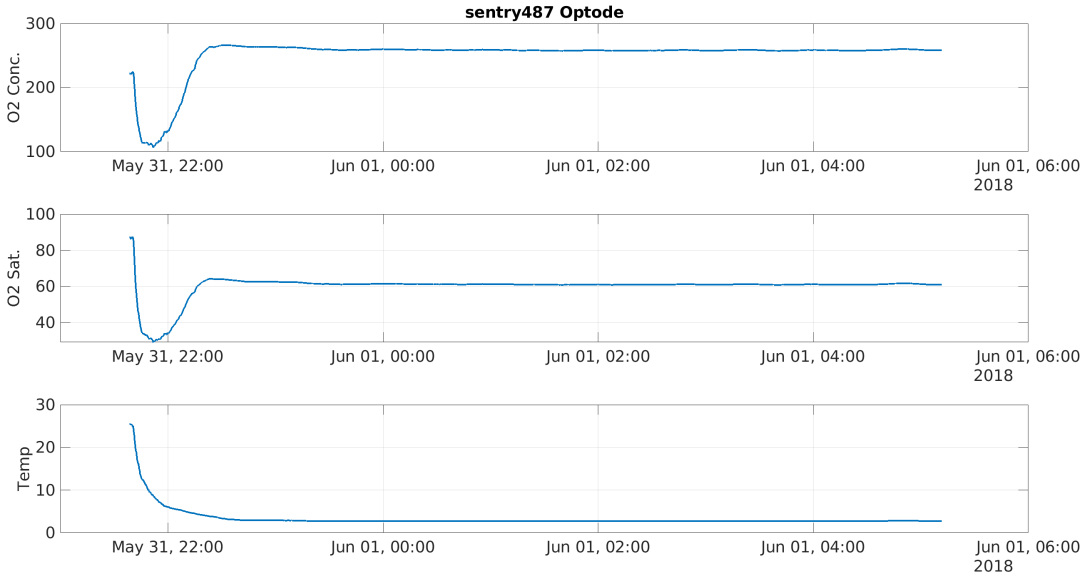


Figure 146: Optode temperature, O2 saturation, and concentration

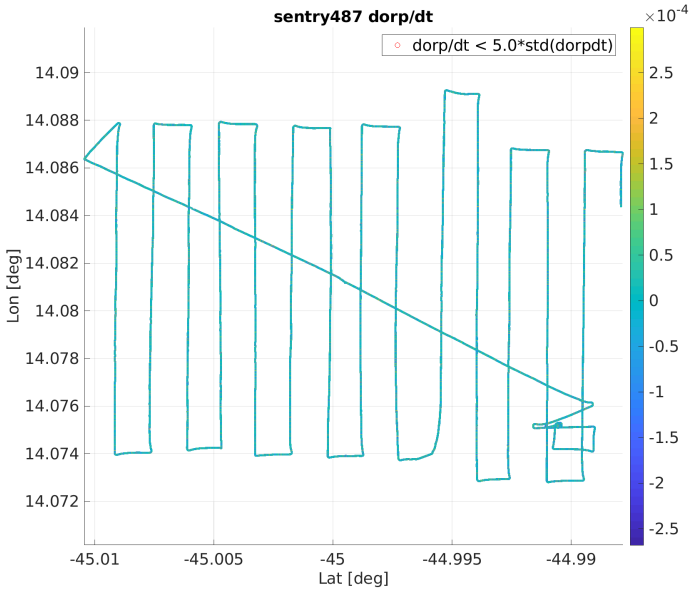


Figure 147: Navigated ORP sensor data.

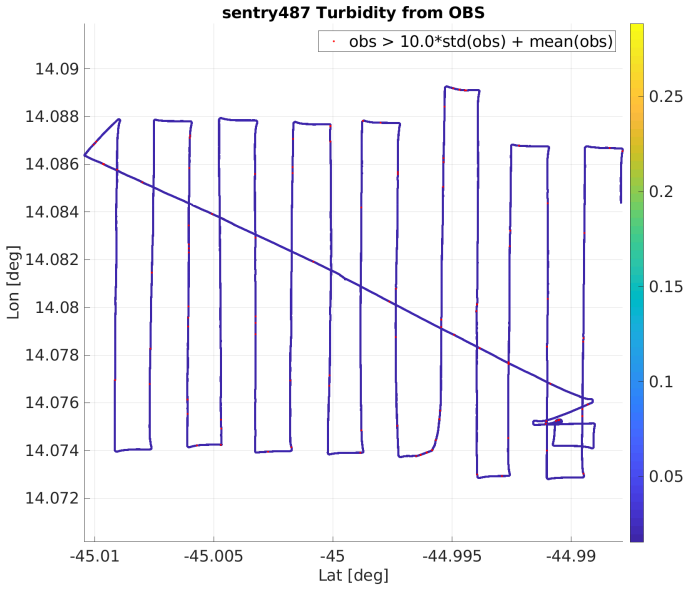


Figure 148: Navigated OBS sensor data.

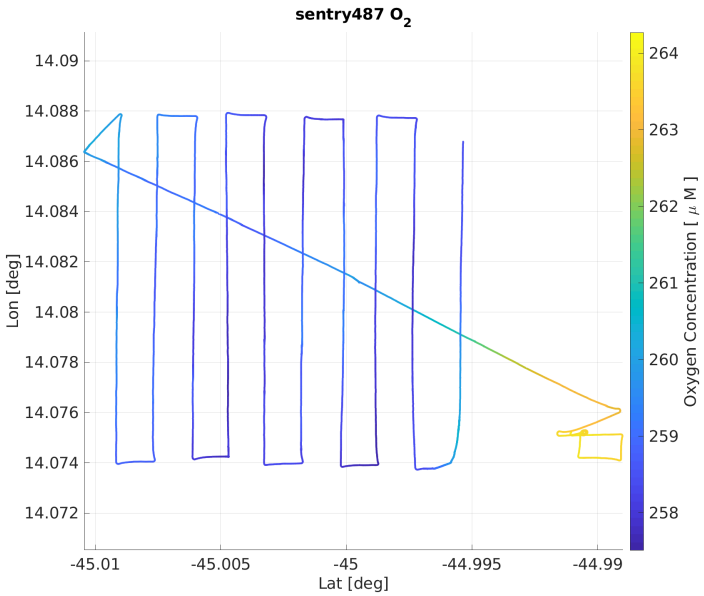


Figure 149: Navigated optode sensor data.

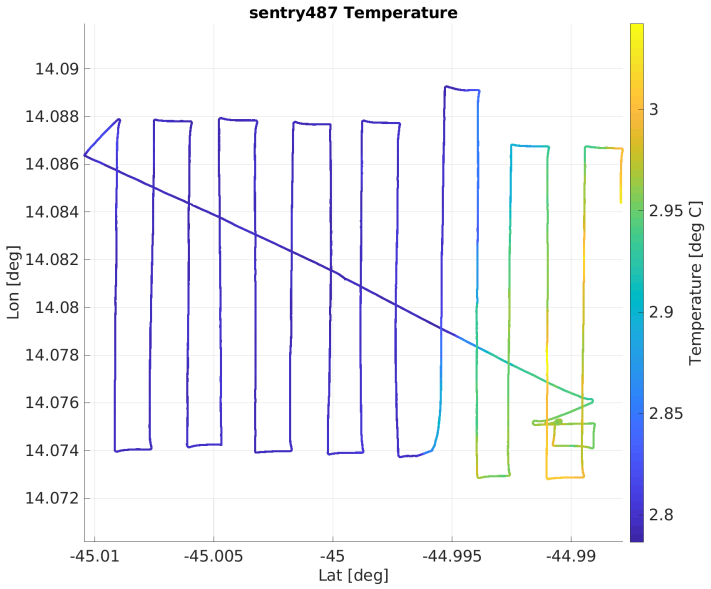
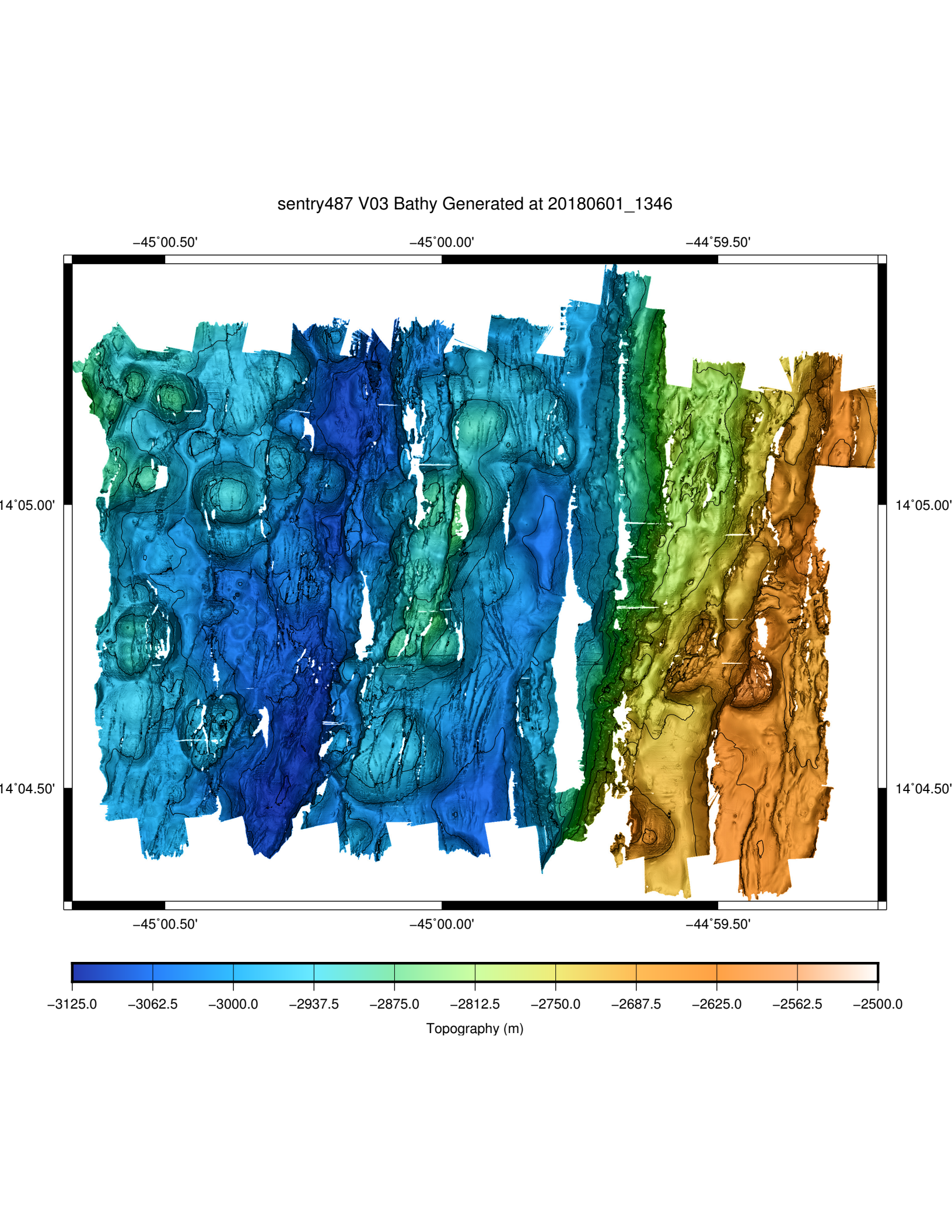


Figure 150: Navigated temperature sensor data


sentry487 V03 Bathy Generated at 20180601_1346
−45˚00.50'
−45˚00.00'
−44˚59.50'
14˚05.00'
14˚04.50'
−3125.0
−3062.5
−3000.0
−2937.5
−2875.0
−2812.5
−2750.0
−2687.5
−2625.0
−2562.5
−2500.0
Topography (m)

Sentry 488 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 2 to 3 ft.

Reason for end of dive: Out of battery.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 13 43.8 -45 -3

Launch Position: sentry488 launch position: 13 44.082'N 045 1.700'W

Narrative

Sentry488 was the sixteenth dive of the cruise. This was planned as an extra long dive to test concurrent ops with Alvin in the water. A total of 40 hours of mission was programmed into Sentry for this dive. Alvin Ops and Sentry Ops discussed dive planning and mission specifics the night before the dive. Requirements for performing concurrent operations with Sentry and Alvin were approved during this cruise by group managers.

The first part of the concurrent ops was to launch Sentry the night before the Alvin dive. Sentry was launched around 20:00 local in area1. The first block of the Sentry mission covered the south west corner of area1, collecting multibeam that would fill in missing areas from existing bathy. This initial survey completed after 10 hours, at which point Sentry began driving to the northern section of area1. At 06:00 local, Atlantis retracted the USBL pole and transited to the Alvin launch position, roughly 20km north. From this point forward, Sentry status would be provided by the waveglider.

Once Alvin and Sentry were both in the water, the minimum distance between both vehicles required was no less than 9km. In this case, the two missions for each vehicle was a very conservative 12km minimum. While Alvin is in the water with Sentry, the surface controller would communicate with the Sentry watch every half hour. Waveglider position, horizontal range to Sentry and Sentry depth would be reported.

There were no issues with the Sentry dive throughout the Alvin ops time period, and the Alvin dive completed at 17:00. Once the Alvin dive was complete, Atlantis transited back to an estimated Sentry position. USBL tracking was re-established once on station, and maintained for the following 3 hours. During those 3 hours, Sentry finished the survey at the top of area1 and began the final survey block on the core complex transect.

When the crossing line of the final survey block was complete, Atlantis left station and completed a gravity core. The gravity core took roughly 3 hours to complete. Following the gravity core, Atlantis would track Sentry until the end of the mission.

Finally Sentry self aborted, once the batteries reached the minimum voltage of 48v, which was roughly 8%. The datapod stack that controls the camera and blueview forward looking sonar, was showing signs of hardware failure once back on deck. This had no impact on the dive, and would be changed out for the next dive.

Issues

- Deadman: XR deadman timers were set incorrectly during the predive. This caused a 20 minute delay to correct this issue.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.31 sentry488 Summary

sentry488 Summary
Origin: 13.700000 -45.066667
Origin: 13 42.000'N 045 4.000'W
Launch: 2018/06/01 21:51:35
Survey start: 2018/06/01 23:24:58
Survey start: Lat:13.736571 Lon:-45.029245
Survey start: Lat:13 44.194'N Lon:045 1.755'W
Survey end: 2018/06/03 05:59:03
Survey end: Lat:13.816602 Lon:-45.050909
Survey end: Lat:13 48.996'N Lon:045 3.055'W
Ascent begins: 2018/06/03 05:59:03
On the surface: 2018/06/03 07:04:03
On deck: 2018/06/03 07:15:46
descent rate: 38.4 m/min
ascent rate: 52.4 m/min
survey time: 30.6 hours
deck-to-deck time 33.4 hours
Min survey depth: 3380m
Max survey depth: 3854m
Mean survey depth: 3577m
Mean survey height: 77m
distance travelled: 76.58km
average speed: 0.69m/s
average speed during photo runs: NaN m/s over 0.00 km
average speed during multibeam runs: 0.69 m/s over 76.58 km
total vertical during survey: 16997m
Battery energy at launch: 20.6 kwhr
Battery energy at survey start: 19.9 kwhr
Battery energy at survey end: 1.3 kwhr
Battery energy on surface: 1.2 kwhr
Battery energy on deck: 1.1 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry488/nav-sci/proc directory within the sentry488_config matlab structure as well as in ascii text logs in sentry488/metadata. At present metadata is not yet automatically collected on all sensors.

0.32 sentry488 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180601_1827.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180601_1827.cfg`
CTD	SBE 49	260		`sbe49_20180601_1828.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180601_1827.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

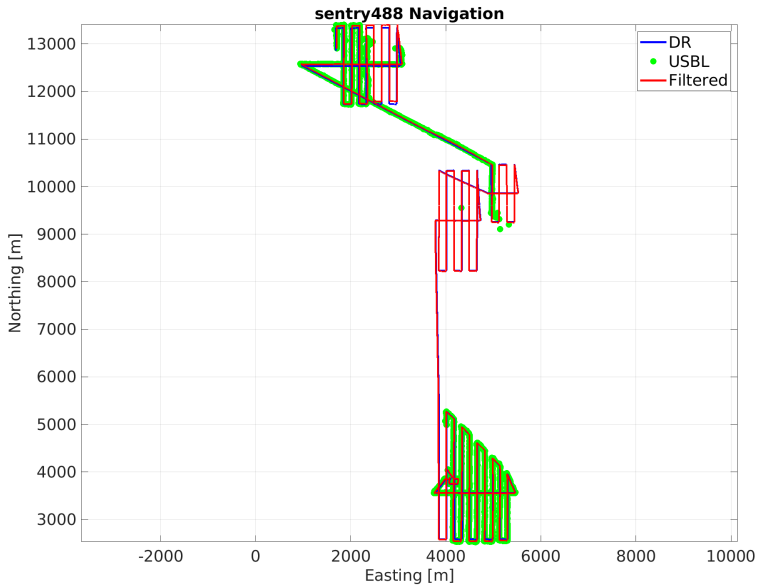


Figure 151: Latitude/Longitude plot of Sentry dive 488 based on post-processed navigation

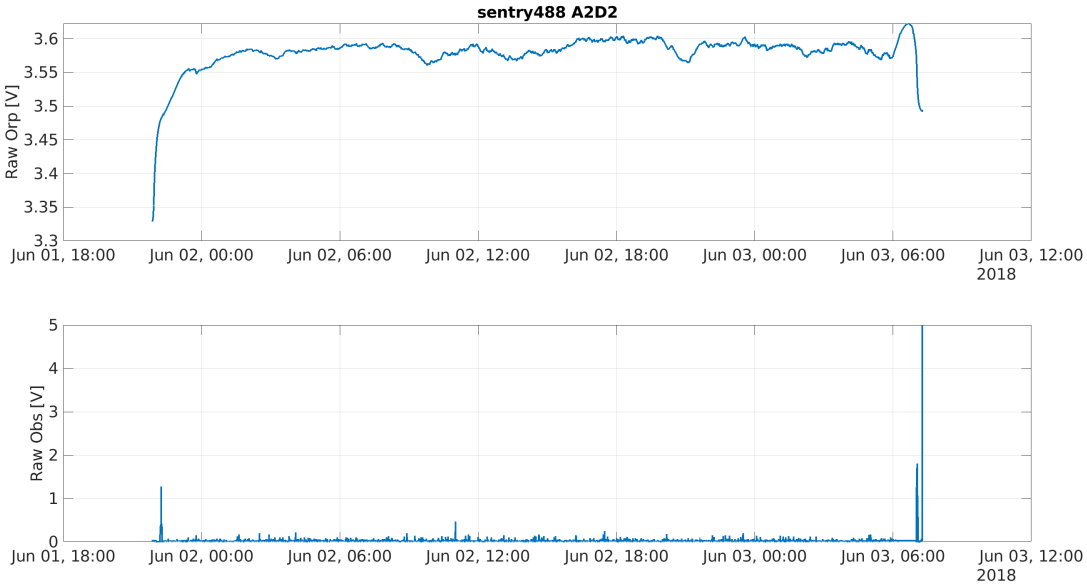


Figure 152: Raw analog Sensor Data

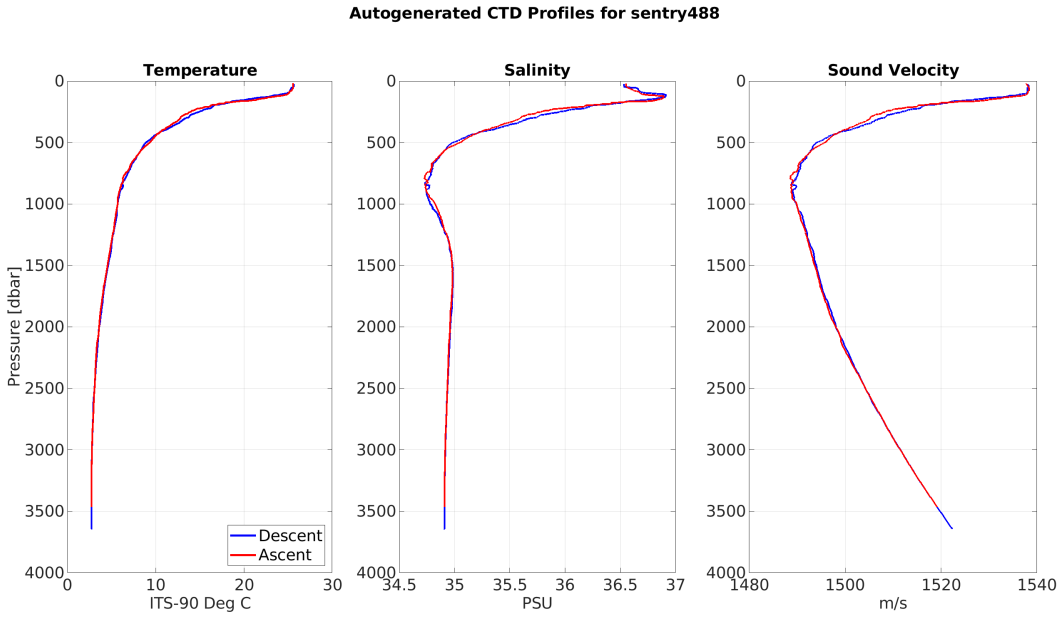


Figure 153: CTD profile sensor data

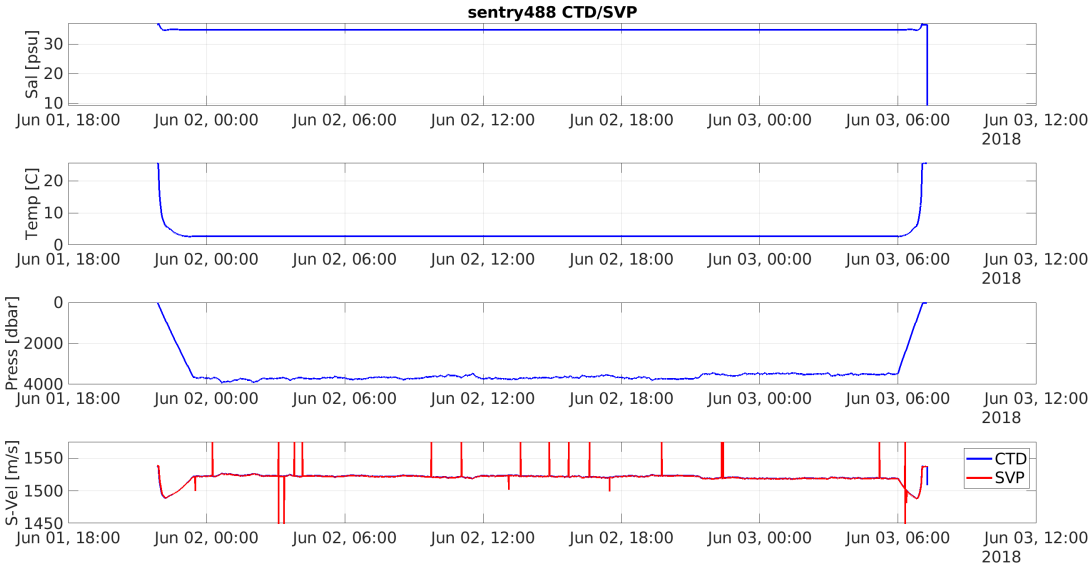


Figure 154: CTD and SVP sensor data

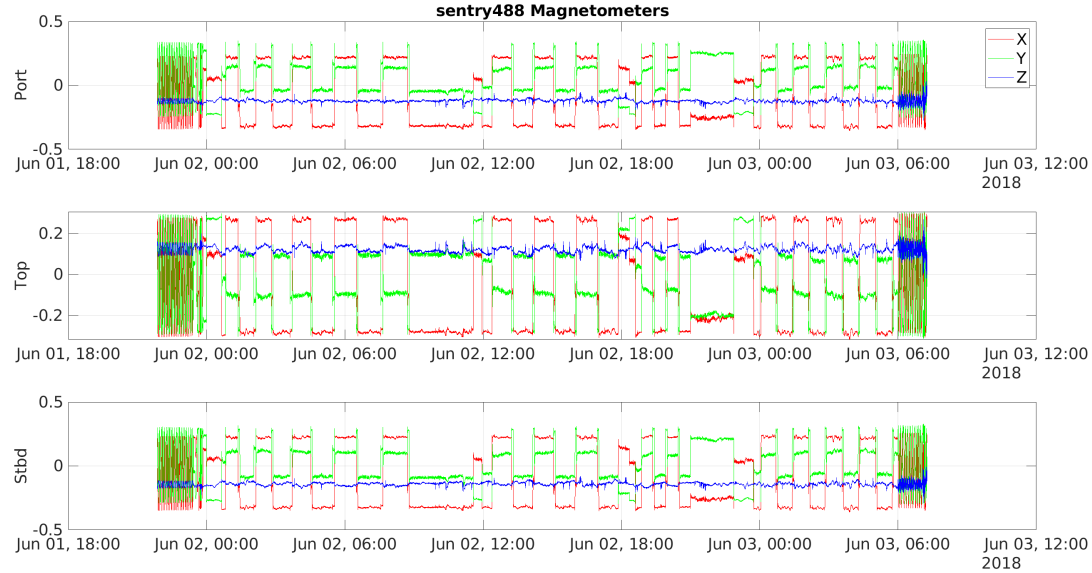


Figure 155: Magnetometer data from each of the three magnetometers on Sentry

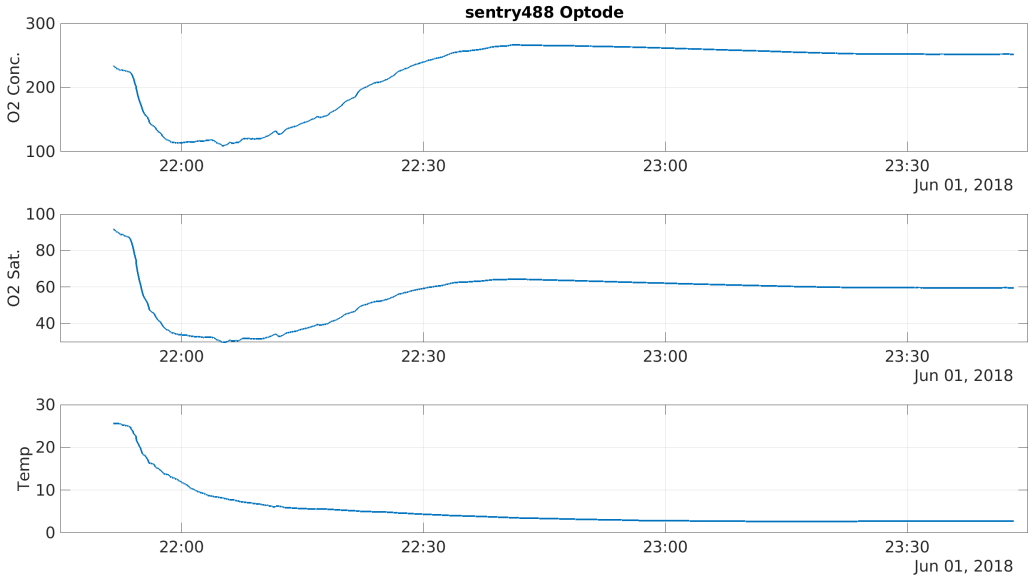


Figure 156: Optode temperature, O2 saturation, and concentration

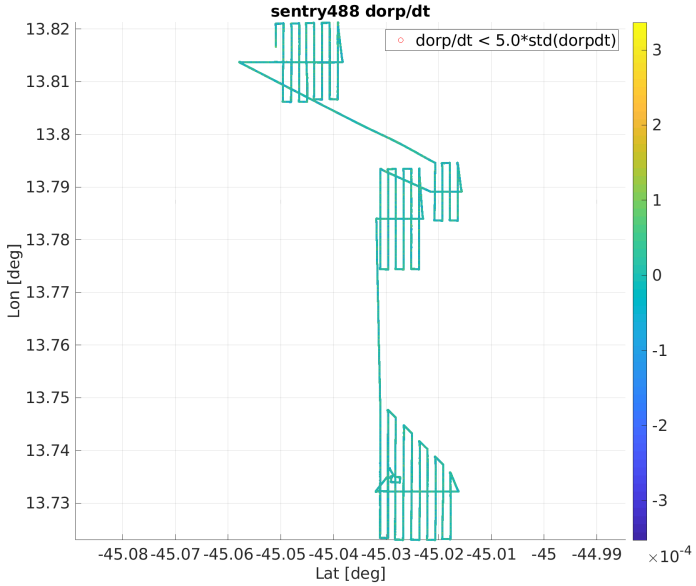


Figure 157: Navigated ORP sensor data.

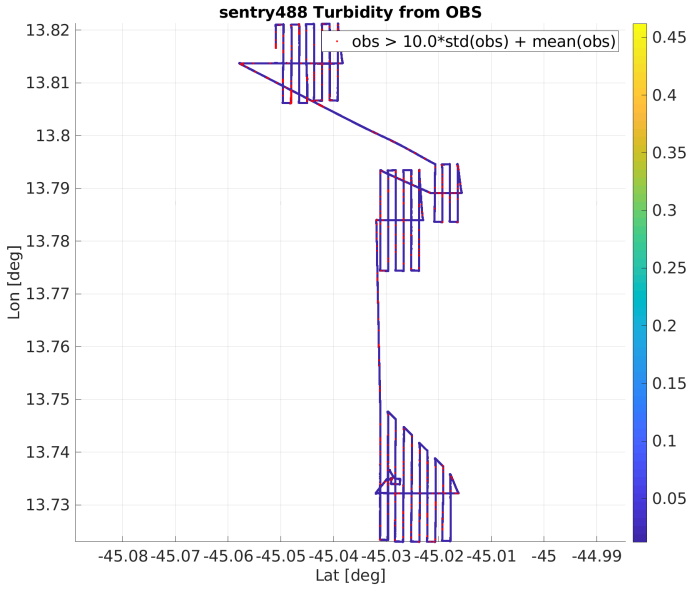


Figure 158: Navigated OBS sensor data.

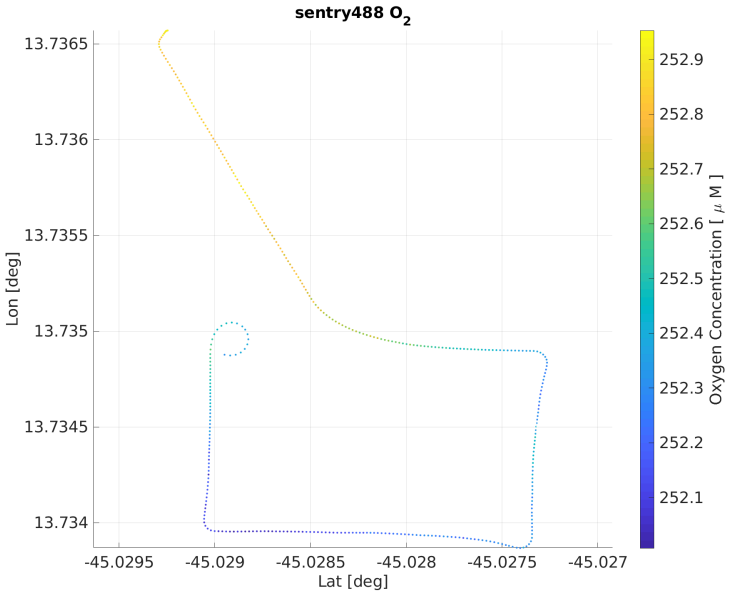


Figure 159: Navigated optode sensor data.

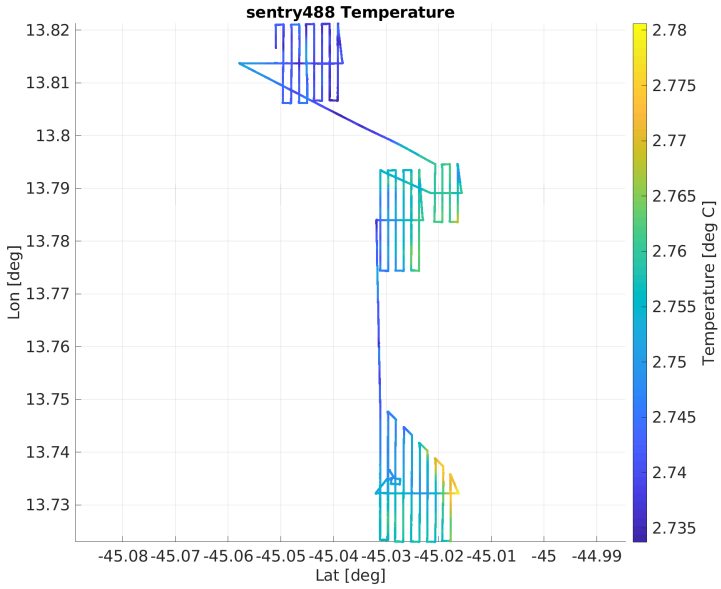
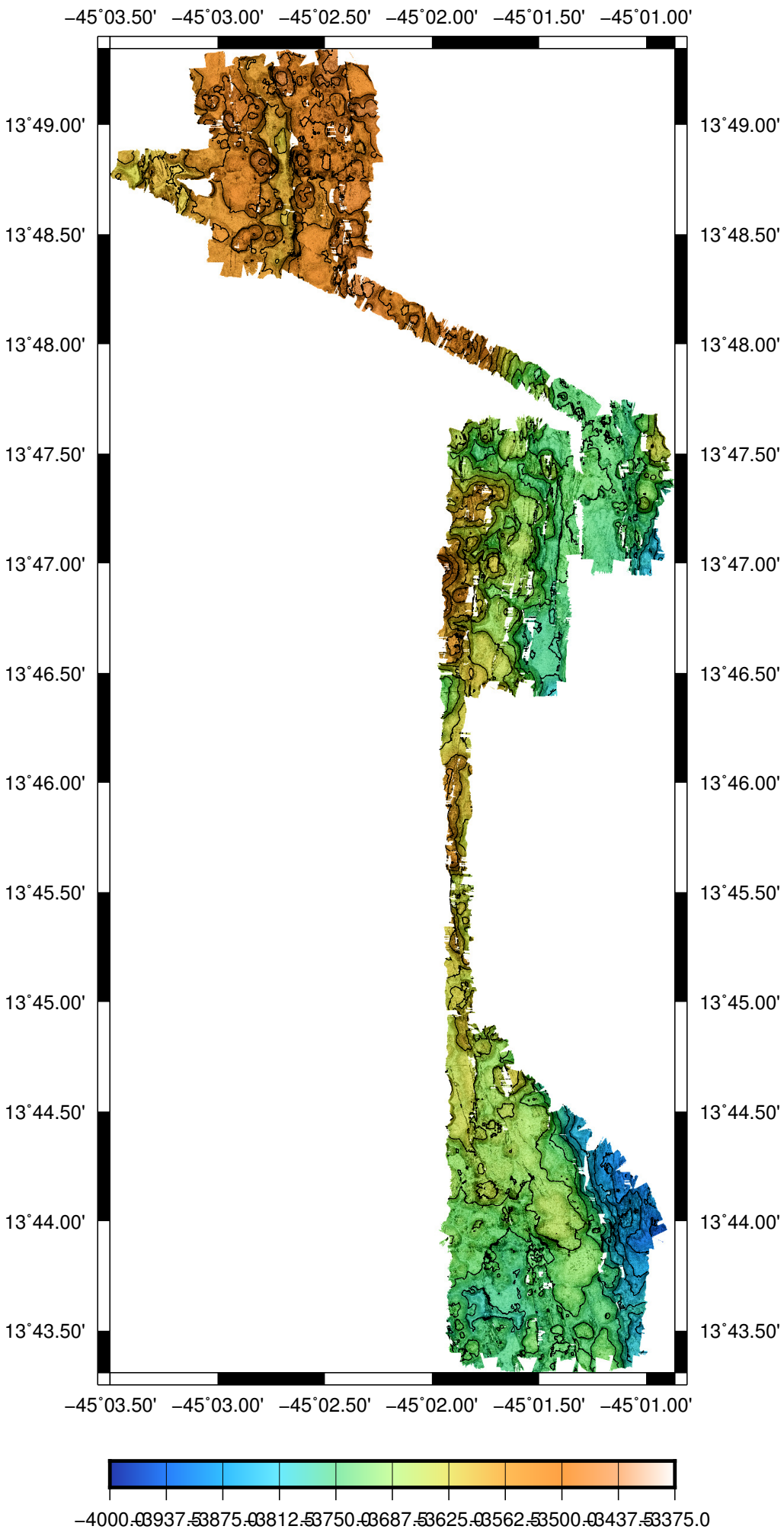


Figure 160: Navigated temperature sensor data


sentry488 V01 Bathy Generated at 20180603_0825
−45°03.50'
−45°03.00'
−45°02.50'
−45°02.00'
−45°01.50'
−45°01.00'
13°49.00'
13°48.50'
13°48.00'
13°47.50'
13°47.00'
13°46.50'
13°46.00'
13°45.50'
13°45.00'
13°44.50'
13°44.00'
13°43.50'
−4000.0
−3937.5
−3875.0
−3812.5
−3750.0
−3687.5
−3625.0
−3562.5
−3500.0
−3437.5
−3375.0
Topography (m)

Sentry 489 Dive Report
DRAFT

Sean Kelley, Justin Fujii, Ian Vaughn, Jennifer Vaccaro, Manyu Belani

Sentry Expedition Leader: Sean Kelley

Summary

Weather: winds 10 to 15 knots, seas 2 to 3 ft.

Reason for end of dive: Out of alloted time.

Vehicle Configuration

The science sensing suite for this dive was:

This dive was navigated using the DVL/INS system in real time. USBL provided post-dive corrections.

Important Positions

Dive Origin: 14 2 -45 -5

Launch Position: sentry489 launch position: 14 4.749'N 045 4.100'W

Narrative

Sentry489 was the seventeenth and final dive of the cruise. This dive covered an area 1.5km tall by 2km wide in the area2 transect, surveying east to west. Decktest,Launch and Descent were normal and free of any issues. Sentry launched promptly at 19:30 local following the transit to this station.
The Alvin observation vehicle was deployed once sentry reached bottom and started the mission. The waveglider operations were continued through this dive, testing a new survey pattern for the waveglider. Waveglider was recovered at 07:00, with Sentry back on deck by 08:40.

Issues

- None: None.

Chief Scientist Comments

The Chief scientist is requested to include any desired comments.

Dive Statistics

0.33 sentry489 Summary

sentry489 Summary
Origin: 14.033333 -45.083333
Origin: 14 2.000'N 045 5.000'W
Launch: 2018/06/03 21:30:07
Survey start: 2018/06/03 22:38:06
Survey start: Lat:14.079770 Lon:-45.070809
Survey start: Lat:14 4.786'N Lon:045 4.249'W
Survey end: 2018/06/04 09:34:26
Survey end: Lat:14.086217 Lon:-45.076955
Survey end: Lat:14 5.173'N Lon:045 4.617'W
Ascent begins: 2018/06/04 09:34:26
On the surface: 2018/06/04 10:20:57
On deck: 2018/06/04 10:30:25
descent rate: 39.1 m/min
ascent rate: 52.1 m/min
survey time: 10.9 hours
deck-to-deck time 13.0 hours
Min survey depth: 2379m
Max survey depth: 2852m
Mean survey depth: 2670m
Mean survey height: 79m
distance travelled: 35.97km
average speed: 0.89m/s
average speed during photo runs: 0.20 m/s over 0.01 km
average speed during multibeam runs: 0.89 m/s over 35.96 km
total vertical during survey: 8034m
Battery energy at launch: 15.6 kwhr
Battery energy at survey start: 15.1 kwhr
Battery energy at survey end: 5.0 kwhr
Battery energy on surface: 4.9 kwhr
Battery energy on deck: 4.8 kwhr

Sensor Information

This is a recently added section with selected sensor metadata. This section will be expanded in coming months. Additional data is available in the sentry489/nav-sci/proc directory within the sentry489_config matlab structure as well as in ascii text logs in sentry489/metadata. At present metadata is not yet automatically collected on all sensors.

0.34 sentry489 Devices

Instrument	Model	Serial Num.	Comments	Config File
USBL	Sonardyne AvTrak2	U001AA5		`avtrak_20180603_1821.cfg`
DVL	RDI Navigator (300kHz)	727-2000-00M	CX: 1, WP: 0	`dvl300_20180603_1821.cfg`
CTD	SBE 49	260		`sbe49_20180603_1822.cfg`
SAIL	obs A/D orp A/D	13 9	A: 5, G: 1.00, O: 0 A: 3, G: 1.00, O: 0.002	`a2d2-pods_20180603_1821.cfg`

Plots and Images

This section contains selected images of data products and plots of vehicle navigation and selected sensors.

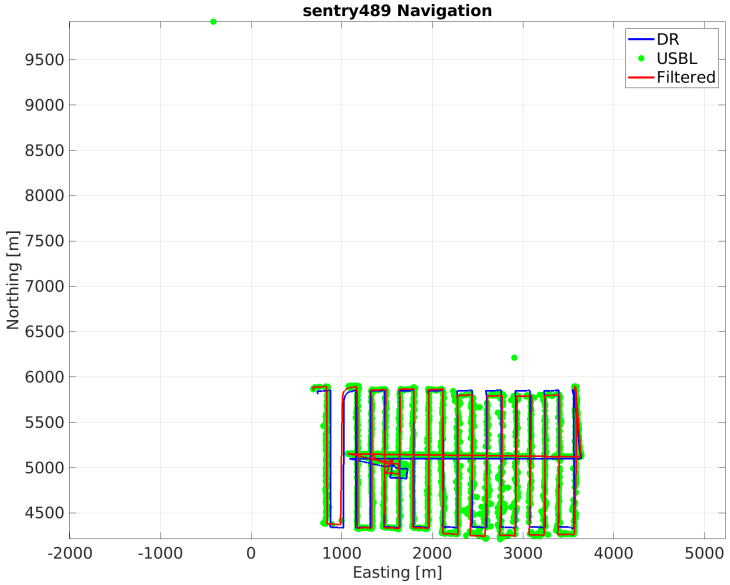


Figure 161: Latitude/Longitude plot of Sentry dive 489 based on post-processed navigation

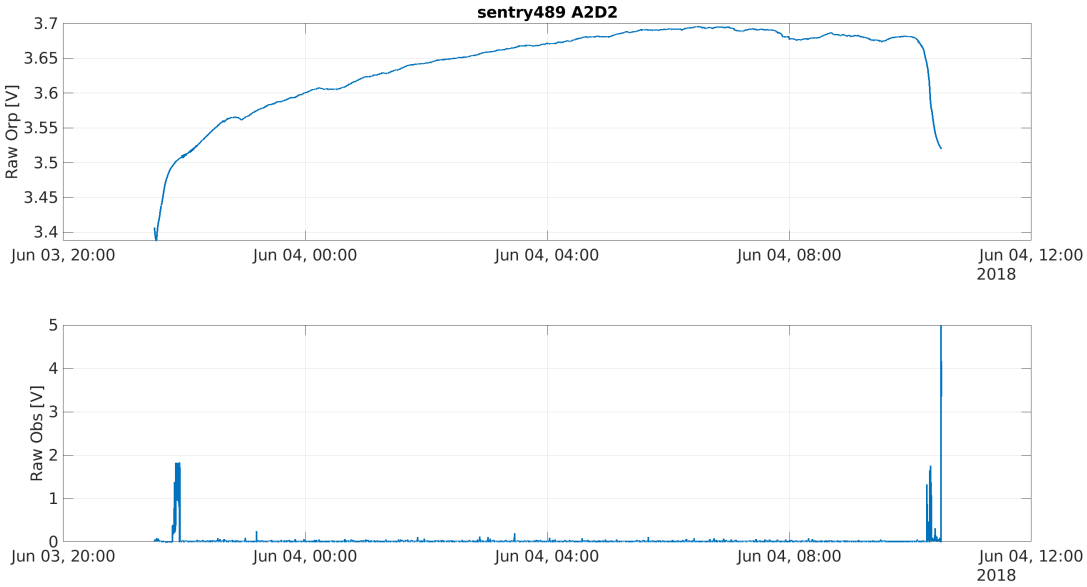


Figure 162: Raw analog Sensor Data

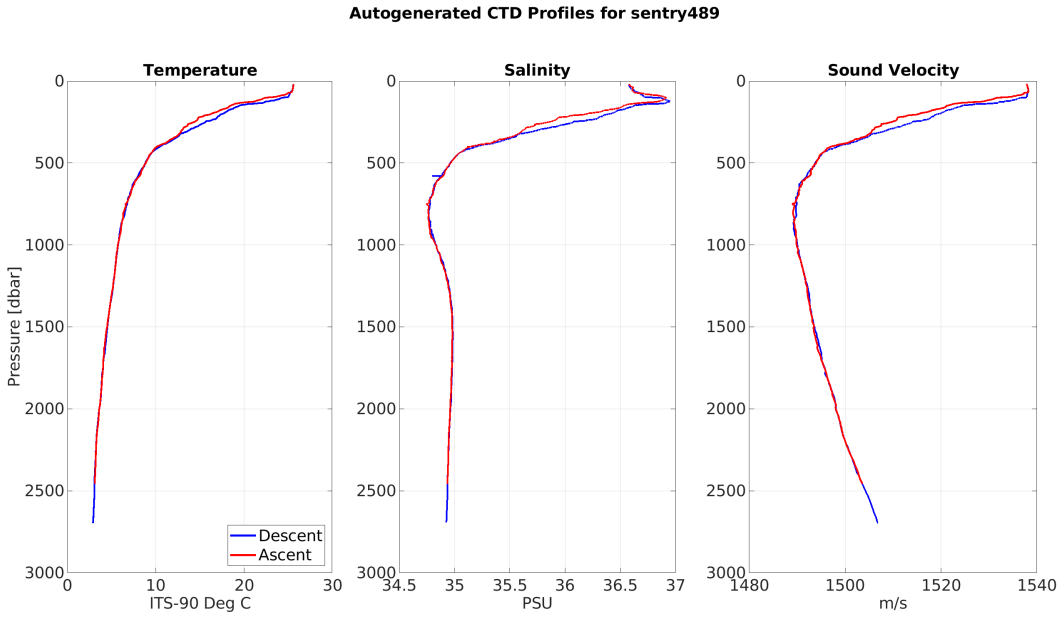


Figure 163: CTD profile sensor data

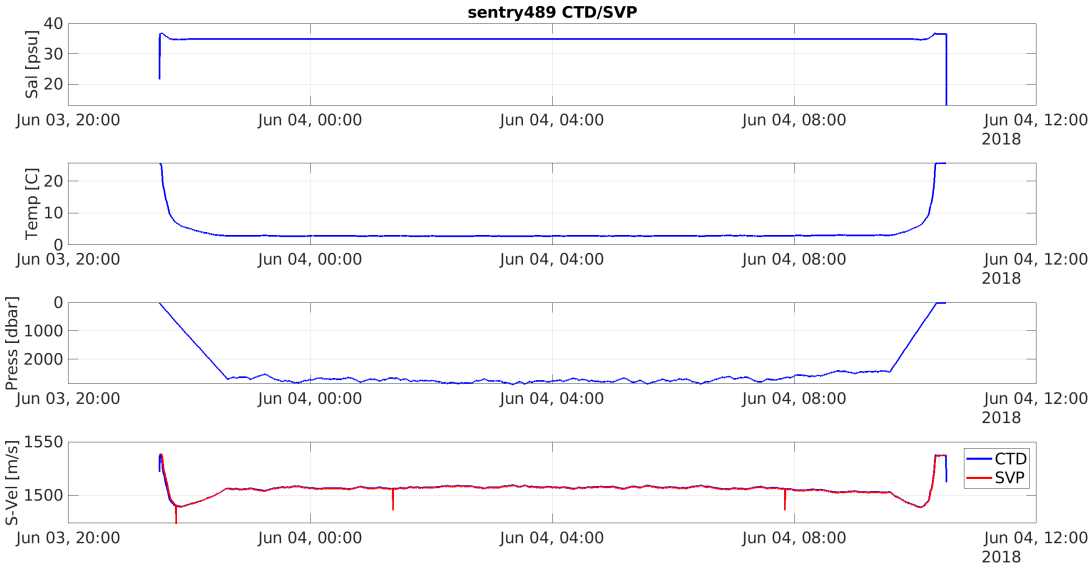


Figure 164: CTD and SVP sensor data

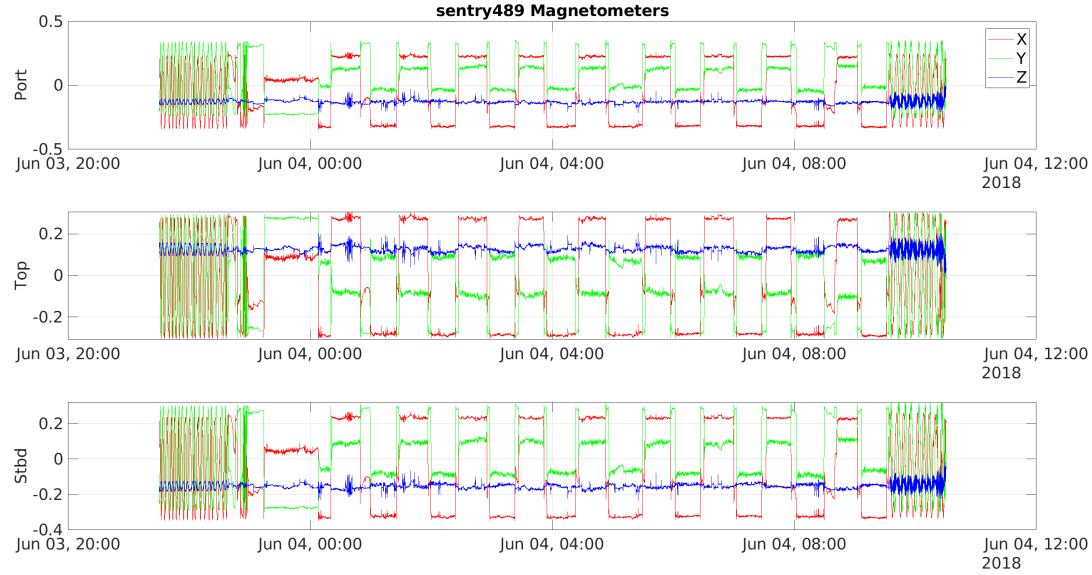


Figure 165: Magnetometer data from each of the three magnetometers on Sentry

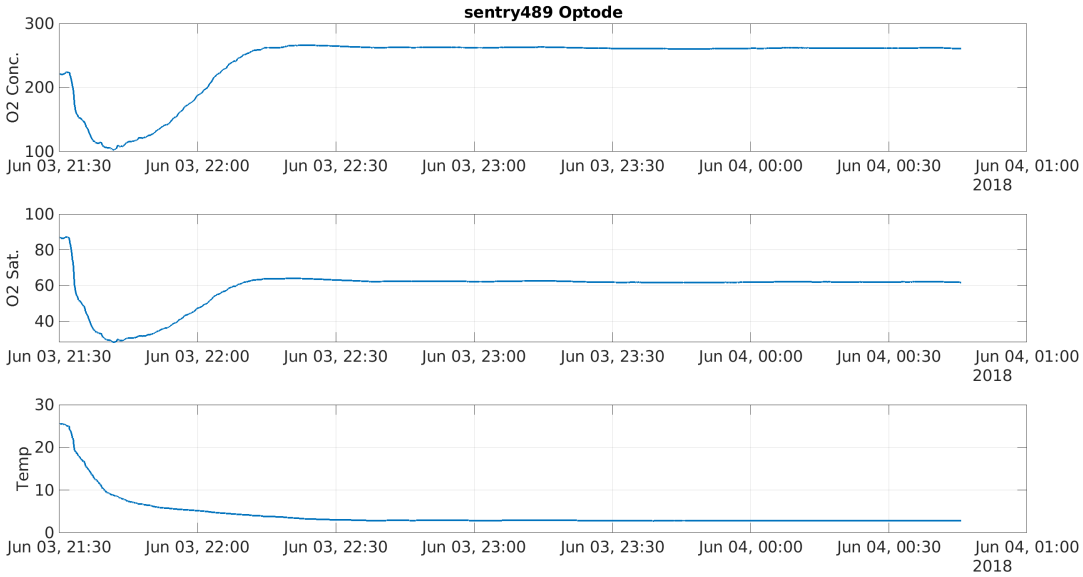


Figure 166: Optode temperature, O2 saturation, and concentration

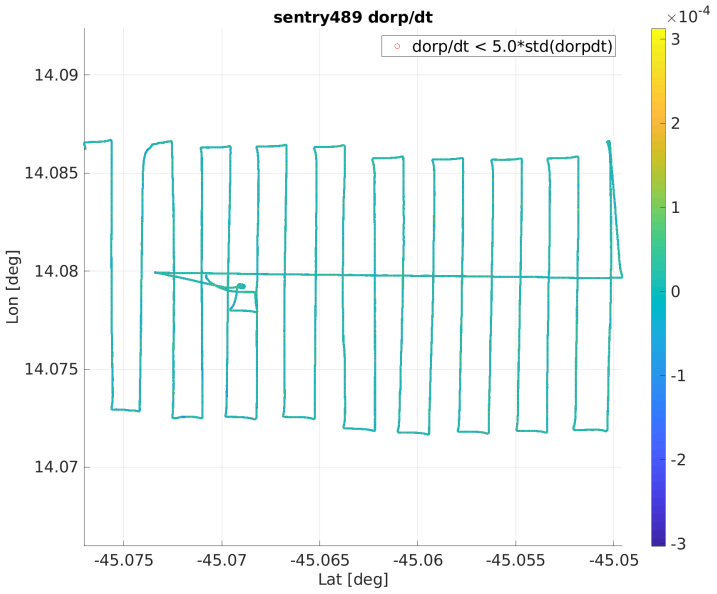


Figure 167: Navigated ORP sensor data.

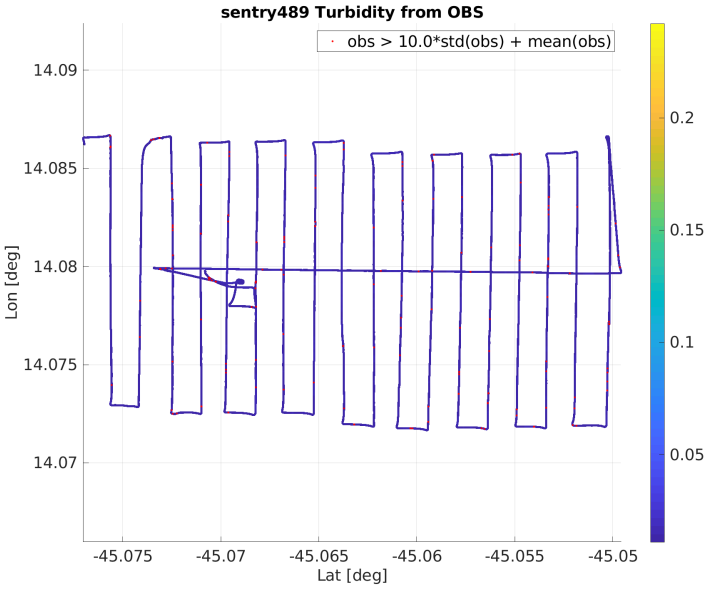


Figure 168: Navigated OBS sensor data.

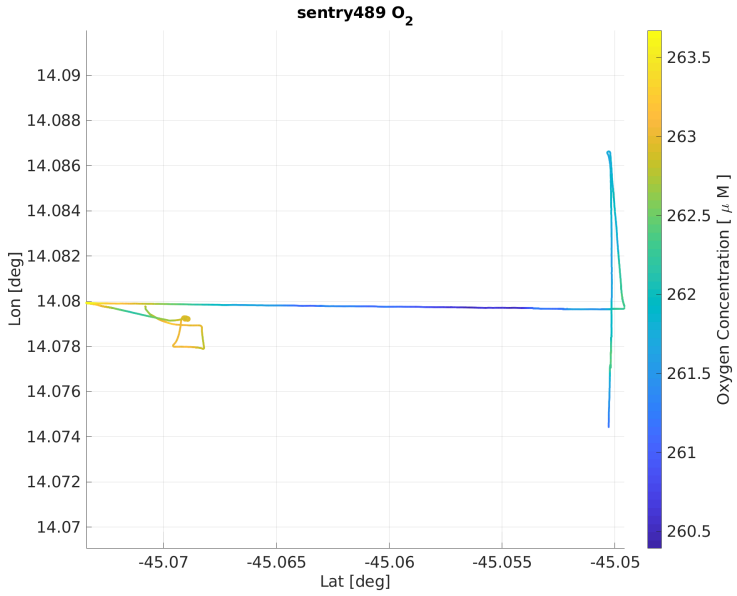


Figure 169: Navigated optode sensor data.

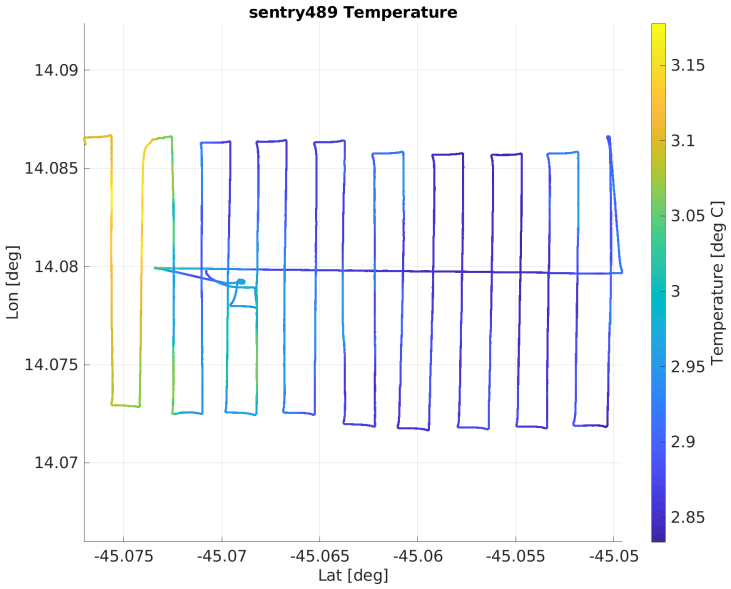
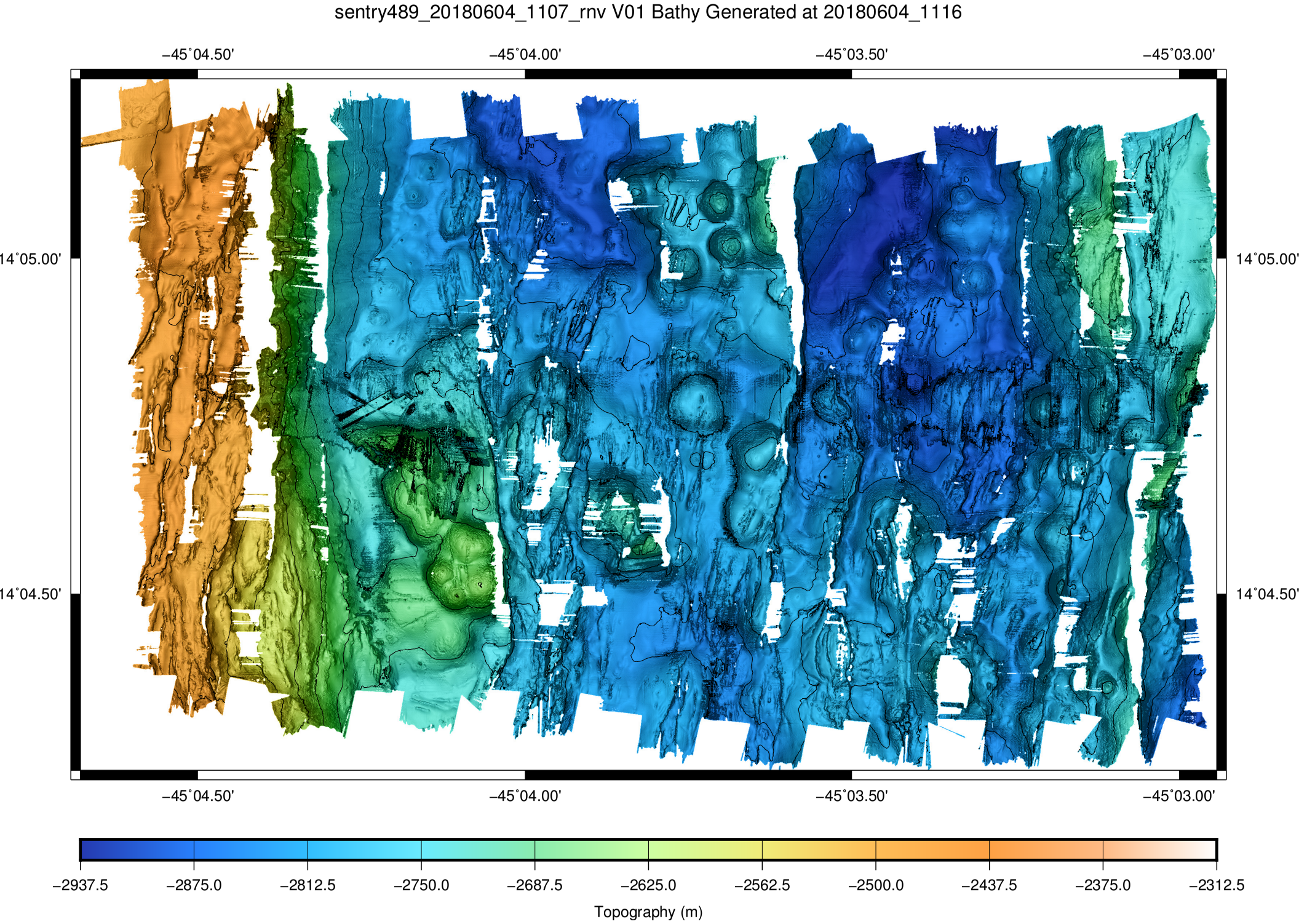


Figure 170: Navigated temperature sensor data


sentry489_20180604_1107_rnv V01 Bathy Generated at 20180604_1116
−45˚04.50'
−45˚04.00'
−45˚03.50'
−45˚03.00'
14˚05.00'
14˚04.50'
−2937.5
−2875.0
−2812.5
−2750.0
−2687.5
−2625.0
−2562.5
−2500.0
−2437.5
−2375.0
−2312.5
Topography (m)