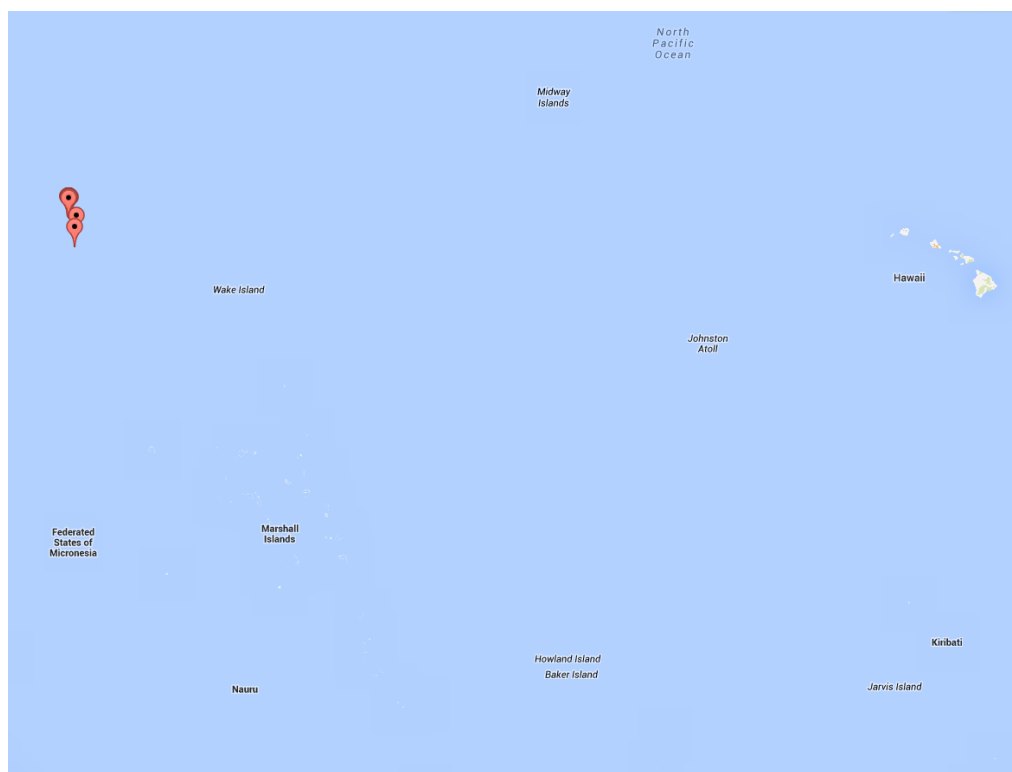


# CRUISE REPORT: PR02S

(Updated Oct 2014)



## Highlights

### Cruise Summary Information

Section Designation	<b>PR02S</b> (aka: HOT-258, KM1323)		
Expedition designation (ExpoCodes)	<b>33KB20131219</b>		
Chief Scientists	<b>Brett Updyke / U Hawaii</b>		
Dates	2013 Dec 19 - 2013 Dec 23		
Ship	R/V <i>Kilo Moana</i>		
Ports of call	Snug harbor		
Geographic Boundaries	22° 45' N		
	157° 57.01' W	158° 21.8' W	
	21° 20.6' N		
Stations	4		
Floats and drifters deployed	2 short-term drifting arrays deployed		
Moorings deployed or recovered	0		

### Contact Information:

Brett Updyke

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[updyke@hawaii.edu](mailto:updyke@hawaii.edu)

## Links To Select Topics

Shaded sections are not relevant to this cruise or were not available when this report was compiled.

Cruise Summary Information	Hydrographic Measurements
Description of Scientific Program	CTD Data:
Geographic Boundaries	Acquisition
Cruise Track (Figure): PI CCHDO	Processing
Description of Stations	Calibration
Description of Parameters Sampled	Temperature Pressure
Bottle Depth Distributions (Figure)	Salinities Oxygens
Floats and Drifters Deployed	Bottle Data
Moorings Deployed or Recovered	Salinity
	Oxygen
Principal Investigators	Nutrients
Cruise Participants	Carbon System Parameters
	CFCs
Problems and Goals Not Achieved	Helium / Tritium
Other Incidents of Note	Radiocarbon
Underway Data Information	References
Navigation Bathymetry	
Acoustic Doppler Current Profiler (ADCP)	
Thermosalinograph	
XBT and/or XCTD	
Meteorological Observations	Acknowledgments
Atmospheric Chemistry Data	
Data Processing Notes	

# **HOT 258: Chief Scientist Report**

Chief Scientist: Brett Updyke

**R/V *Kilo Moana***

December 19 – December 23, 2013

Cruise ID: **KM1323**

Departed: 19 December at 0845 (HST)

Returned: 23 December at 0746 (HST)

Vessel: **R/V *Kilo Moana***

Master of the Vessel: Captain Gray Drewry

OTG Marine Technicians: Trevor Young and Daniel Fitzgerald

## **1. SCIENTIFIC OBJECTIVES**

The objective of the cruise was to maintain a collection of hydrographic and biogeochemical data at the Hawaii Ocean Time-series (HOT) stations. Four stations were to be occupied during the cruise, in the following order:

- 1) Station 1, referred to as Station Kahe, is located at 21° 20.6'N, 158° 16.4'W and was to be occupied on December 19<sup>th</sup> for about 2 hours.
- 2) Station 2, referred to as Station ALOHA, is defined as a circle with a 6 nautical mile radius centered at 22° 45'N, 158°W. This is the main HOT station and was to be occupied during December 20<sup>th</sup>- 22<sup>nd</sup>.
- 3) Station 52, the site of WHOTS-10 Mooring (anchor position 22° 40.12'N 157° 57.01'W) was to be occupied on December 22<sup>nd</sup> for about one hour.
- 4) Station 6, referred to as Station Kaena, is located off Kaena Point at 21° 50.8'N, 158° 21.8'W and was to be occupied on December 22<sup>nd</sup> for approximately 2 hours.

Upon arrival to Station Kahe a 1300 lb. weight-test cast to 500 m, one CTD cast to 1000 m, and a Hyperpro cast were to be conducted on the afternoon of December 19<sup>th</sup>. The single CTD cast was to be conducted to collect continuous profiles of various physical and chemical parameters. Water samples were to be collected at discrete depths for biogeochemical measurements. After these operations were satisfactorily completed, the ship was to proceed to Station ALOHA.

Upon arrival to Station ALOHA, the free-drifting sediment trap array was to be deployed. The sediment trap array was to stay in the water for about 56 hours. This was to be followed by two net tows and a 1000 m CTD cast for preparation of the Primary Productivity Array. This cast was to be followed by the deployment of the free-drifting Primary Productivity Array to incubate *in situ* for 12 hours. A full-depth (~4740 m) CTD cast was to be conducted after the deployment of the Primary Productivity Array, followed by 1000 m CTD casts at strict 3 hour intervals for at least 36 hours for continuous and discrete data collection, ending with another full-depth CTD cast at 2300 on December 21<sup>st</sup>.

Another free-drifting array (Gas Array) was to be deployed for 24 hours for incubation experiments on December 21<sup>st</sup>. The Gas Array was to be recovered on December 22<sup>nd</sup>.

A plankton net was to be towed between 1000-1400, and 2200-0200 for 30 minute intervals on December 20<sup>th</sup> and 21<sup>st</sup> at Station ALOHA.

The Hyperpro was to be deployed for approximately 45 minutes at 1400 hours on December 19<sup>th</sup>, 20<sup>th</sup>, and 22<sup>nd</sup> to collect three profiles during each deployment.

A package including a Wet Labs AC9, a Chelsea Fast Repetition Rate Fluorometer (FRRf), a SeaBird Seacat, and a LISST particle size and distribution analyzer was to be used to profile the upper 200 m at Station ALOHA in the early morning and at 1000 hours on December 22<sup>nd</sup>.

A trace metal free sample was to be collected by the ATE sampler on December 21<sup>st</sup> at Station ALOHA.

After the 36 hour burst period of CTD work at Station ALOHA was accomplished, the ship was to transit to recover the floating Gas Array and the Sediment Trap Array on the morning of December 22<sup>nd</sup>.

After recovering the arrays, the ship was to transit to Station ALOHA to conduct an AC9/FRRf cast. After these operations were complete, the ship was to transit to Station 52 to conduct a one-hour 200 m CTD yo-yo cast and surface instrument intercomparisons. After the yo-yo cast was complete, the ship was to transit to Station ALOHA for a Hyperpro cast at 1400 hours.

Once operations at Station ALOHA were complete, the ship was to transit to Station 6, referred to as Station Kaena where a near-bottom CTD cast (~2500 m) was to be conducted to collect salinity and chlorophyll samples for calibration.

After Station Kaena operations were complete, the ship was to transit back to Snug Harbor.

The following instruments were to collect data throughout the cruise: shipboard ADCP, thermosalinograph, *p*CO<sub>2</sub> system, underway fluorometer and the meteorological suite.

## 2. SCIENCE PERSONNEL

<b>Participant</b>	<b>Title</b>	<b>Affiliation</b>
Dan Sadler	Research Associate	UH
Karin Björkman	Research Specialist	UH
Blake Watkins	Marine Engineer	UH
Susan Curless	Research Associate	UH
Adriana Harlan	Research Associate	UH
Brett Updyke	Research Associate	UH
Benedetto Barone	Postdoctoral Researcher	UH
Stuart Goldberg	Postdoctoral Researcher	UH
Jefrey Snyder	Marine Technician	UH
Joseph Gum	Research Associate	UH
Cameron Fumar	Research Associate	UH
Daniel McCoy	Research Associate	UH
Damion Rosbrugh	Undergraduate Student	UH
Ken Doggett	Research Associate	UH
Anne Thompson	Scientist	B/D Biosciences
Erica Goetze	Assistant Professor	UH
Russ Hopcroft	Professor	UAF
Chris Schvarcz	Graduate Student	UH
Sara Thomas	Graduate Student	UH
Trevor Young	Marine Technician	OTG
Dan Fitzgerald	Marine Technician	OTG



### 3. GENERAL SUMMARY

Operations at Station ALOHA were conducted as planned. One 1000 m CTD cast was completed at Station Kahe. Two near bottom CTD casts and thirteen 1000 m CTD casts were conducted at Station ALOHA. One 200 m yo-yo CTD cast was completed near the WHOTS mooring (Station 52) with three cycles completed. One near bottom cast was completed at Station Kaena.

The Dynacon trawl winch with the 0.681" wire and the A-frame were used for CTD operations.

The Sediment Traps, Primary Productivity Array and Gas Array were all deployed and recovered successfully.

Six net tows for the core HOT zooplankton collection were completed successfully; three during the day, and three during the night. Thirteen net tows for ancillary copepod egg production and metagenetic experiments were completed successfully.

Hyperpro casts (3 cycles each) were conducted on December 19<sup>th</sup>, December 20<sup>th</sup>, and December 22<sup>nd</sup>.

The optical package ACS/AC9/FRRf/LISST was deployed twice (2 cycles each) on December 22<sup>nd</sup> in the early morning and at 1000 hours.

The ATE sampler was deployed and one trace metal free seawater sample was collected.

The underway thermosalinograph, fluorometer and the ship's meteorological suite ran without interruption during the cruise. The Ultrasonic anemometer showed wind direction glitches sporadically during the cruise. The broad band/narrow band Ocean Surveyor ADCP and the Workhorse ADCP were working correctly, however the underway  $p\text{CO}_2$  system was not operational during the cruise.

Winds were from the east starting at 15 kts and decreased throughout the cruise to about 6 knots on December 22<sup>nd</sup>. Seas were slight to moderate with a 6-8 ft swell.

### 4. R/V *Kilo Moana* OFFICERS AND CREW, TECHNICAL SUPPORT

The R/V *Kilo Moana* continues to maintain good ship support for our work. Captain Gray Drewry and the ship's crew showed enthusiasm, concern, and dedication to our scientific mission.

Technical support during this cruise was good. OTG personnel were available to assist in our work during the cruise.

### 5. DAILY REPORT OF ACTIVITIES (HST)

#### **December 19, 2013**

0845 - Depart Snug harbor

0915 - Safety briefing with the Captain

1000 - Fire and boat drill

1138 - Arrive at Station Kahe

1143 - Start weight cast to 500 m

1229 - End weight cast

1254 - Start S1C1 CTD cast to 1000 m

1413 - End S1C1

1421 - Start Hyperpro cast

1458 - End Hyperpro cast  
1502 - Transit to Station ALOHA  
2258 - Arrive at Station ALOHA  
2303 - Start sediment traps deployment  
2323 - Sediment traps deployed (22° 44.991' N, 158° 03.227' W)  
2337 - Start net tow for Erica Goetze

### **December 20, 2013**

0010 - End net tow  
0011 - Start net tow (Erica Goetze)  
0044 - End net tow  
0150 - Start S2C1 CTD cast to 1000 m  
0313 - End S2C1  
0421 - Start primary productivity array deployment  
0436 - Primary productivity array deployed (22° 45.011' N, 158° 02.028' W)  
0438 - Transit to center of ALOHA  
0501 - Start S2C2 CTD cast to near-bottom  
0658 - 10 m off bottom (22° 45.053' N, 157° 59.979' W)  
0857 - End S2C2  
0900 - Transit to pump tanks  
1010 - Start net tow (HOT)  
1040 - End net tow  
1114 - Start S2C3 CTD cast to 1000 m  
1242 - End S2C3  
1318 - Start net tow (Erica Goetze)  
1352 - End net tow  
1402 - Start Hyperpro cast  
1443 - End Hyperpro  
1455 - Start S2C4 CTD cast to 1000 m  
1611 - End S2C4  
1650 - Start S2C5 CTD cast to 1000 m  
1805 - End S2C5  
1830 - Start Primary Productivity array recovery  
1838 - Ship's line fell off the array  
1858 - Start 2nd recovery attempt  
1912 - PP array recovered (22° 43.921' N, 158° 02.291' W)  
1915 - Transit to pump ship's tanks  
2000 - Start S2C6 CTD cast to 1000 m  
2129 - End S2C6  
2159 - Start net tow #1 (HOT)  
2228 - End net tow #1 / start net tow #2  
2257 - End net tow #2  
2300 - Start S2C7 CTD cast to 1000 m

### **December 21, 2013**

0016 - End S2C7  
0026 - Start net tow #1 (Erica Goetze)  
0118 - End net tow #1 / Start net tow #2  
0148 - End net tow #2  
0156 - Start S2C8 CTD cast to 1000 m  
0316 - End S2C8

0400 - Deploy gas array (22° 42.57' N, 158° 02.53' W)

0451 - Start S2C9 CTD cast to 1000 m

0618 - End S2C9

0620 - Transit to pump ship's tanks

0755 - Start S2C10 CTD cast to 1000 m

0910 - End S2C10

0957 - Start net tow (HOT)

1030 - End net tow

1035 - Deploy ATE

1058 - Recover ATE

1102 - Start S2C11 CTD cast to 1000 m

1116 - End S2C11

1226 - Start net tow (HOT)

1257 - End net tow

1302 - Start net tow (Erica Goetze)

1333 - End net tow

1334 - Start net tow (Erica Goetze)

1359 - End net tow

1402 - Start net tow (Erica Goetze)

1432 - End net tow

1439 - Start S2C12 CTD cast to 1000 m

1609 - End S2C12

1610 - Transit to pump ship's tanks

1657 - Start S2C13 CTD cast to 1000 m

1810 - End S2C13

1944 - Start net tow (Erica Goetze)

1959 - End net tow

2001 - Start S2C14 CTD cast to 1000 m

2116 - End S2C14

2120 - Transit to center of Station ALOHA

2130 - Start net tow (Erica Goetze)

2200 - End net tow

2208 - Start net tow (HOT)

2238 - End net tow

2243 - Start net tow (Erica Goetze)

2300 - End net tow

2301 - Transit to center of Station ALOHA

2308 - Start S2C15 CTD cast to near-bottom

### **December 22, 2013**

0110 - 5 m off the bottom (22° 44.976' N, 157° 59.987' W)

0254 - End S2C15

0308 - Start AC9/FRRf

0454 - Recover AC9/FRRf

0500 - Transit to Gas Array

0600 - Gas Array recovered (22° 41.994' N, 158° 01.483' W)

0607 - Transit to Sediment Trap Array

0655 - Sediment Trap Array recovered (22° 44.567' N, 158° 03.733' W)

0705 - Transit to pump ship's tanks

0845 - Start S52C1 CTD yo-yo cast to 200 m

0956 - End S52C1

1006 - Start AC9/FRRf profile  
 1155 - Recover AC9/FRRf  
 1209 - Start net tow (Erica Goetze)  
 1220 - End net tow  
 1355 - Start Hyperpro profile  
 1445 - End Hyperpro  
 1500 - Start net tow (Erica Goetze)  
 1511 - End net tow  
 1514 - Transit to Station Kaena  
 2005 - Arrive Station Kaena  
 2008 - Start S6C1 CTD cast to near bottom  
 2210 - End S6C1  
 2215 - Transit to Snug Harbor

### December 23, 2013

0653 - Arrive H buoy  
 0746 - All fast port side to, full offload

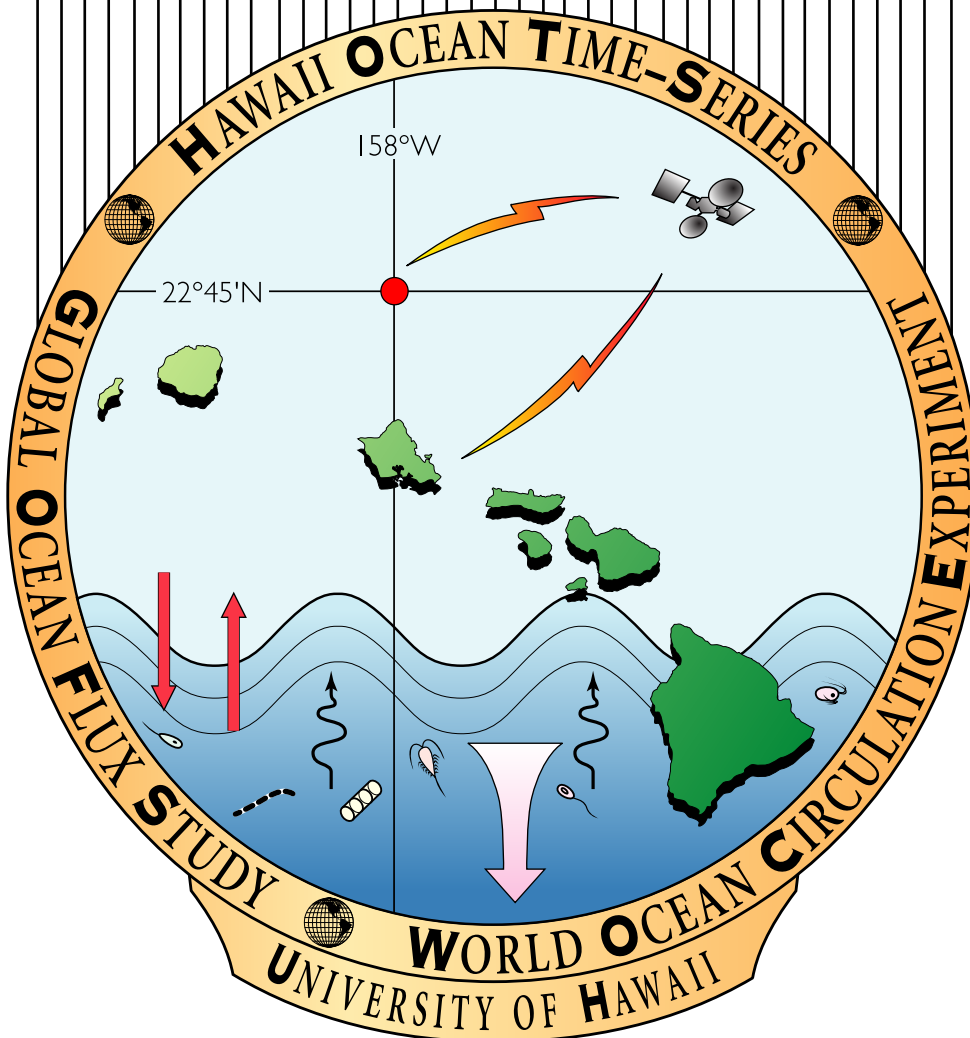
#### 6. HOT program sub-components:

Investigator	Project	Institution
Matt Church	Core biogeochemistry	UH
Dave Karl		
Bob Bidigare		
John Dore	Biogeochemistry QA/QC	MSU
Roger Lukas	Hydrography	UH
Mike Landry	Zooplankton dynamics	SIO
Ricardo Letelier	Optical measurements	OSU
<b>Ancillary programs:</b>		
Andrew Dickson	CO <sub>2</sub> dynamics and intercalibration	SIO
Paul Quay	DI <sup>13</sup> C	UW
Matt Church & Ricardo Letelier	Diversity and activities of nitrogen-fixing microorganisms	UH
Sam Wilson	Reduced gases in the upper ocean: The cycling of methane, sulfide and nitrous oxide	UH
Karin Björkman	Phosphate retention in microbes and size specific bacterial production	UH
Erica Goetze & Russ Hopcroft	Temporal stability of copepod populations at Station ALOHA, metagenetic methods development, egg production experiments, and live imaging	UH, UAF
Ken Doggett & Anne Thompson	Prochlorococcus in the water column	UH, B/D Biosciences

Sara Ferrón-Smith	O <sub>2</sub> /Argon measurements	UH
Christopher Schvarcz	Viral dynamics in the oligotrophic open ocean, Station ALOHA	UH

**Hawaii Ocean Time-series Program**

**HOT 258**



# Hawaii Ocean Time-Series

## HOT-258

### KAHE Station Data Sheet

Station # 1  
 Cast # 1  
 Operator(s): AH, DS, BU, SG, CS

Date: 12/19/13 (HST)  
 Time: 1300 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/Alk	pH	DOC	Nuts	LLN/LLP	Chl <i>a</i>	FCM
1	<b>1000</b>	1	6.7				1			
2	<b>900</b>	2	7.2				2			
3	<b>900</b>	3	7.0				3			
4	<b>750</b>	4,5,6	8.2				4A-B			
5	<b>700</b>	7	7.9				5			
6	<b>600</b>	8	8.3				6			
7	<b>500</b>	9	9.2			7	7			
8	<b>400</b>	10	10.3				8			
9	<b>350</b>	11	11.3			9	9A-B			
10	<b>300</b>	12	15.3				10			
11	<b>250</b>	13	14.6				11			
12	<b>225</b>	14	16.6				12			
13	<b>200</b>	15	17.8			13	13			
14	<b>175</b>	16	18.8			14	14		14	14A-B
15	<b>150</b>	17	20.0			15	15	15	15	15A-B
16	<b>125</b>	18	20.3			16	16A-B		16	16A-B
17	<b>115</b>	19	22.1				17			
18	<b>100</b>	20,21,22	22.5			18	18	18	18A-B	18A-B
19	<b>75</b>	23	24.1			19	19		19	19A-B
20	<b>60</b>	24	24.2				20			
21	<b>45</b>	25	25.4	21	1	21	21	21	21	21A-B
22	<b>25</b>	26	25.5	22	2	22	22		22A-B	22A-B
23	<b>5</b>	27	25.6	23	3,4,5	23	23	23	23	23A-B
24	<b>5</b>	QC	25.8							

**Notes: chl bottle and sample number**  
 14/14, 15/15, 16/16, 18/18a, 25/18b, 19/19, 22/22a, 26/22b, 21/21, 23/23

# Hawaii Ocean Time-series

## HOT-258

### Primary Production Data Sheet

Station # 2  
 Cast # 1  
 Operator(s): SC, KB

Date: 12-20-13 (HST)  
 Time: 0200 (HST)

Rosette Position	Desired Depth	Light Bottle	Chl <i>a</i>	FCM	KB		
1	<b>1000</b>						
2	<b>Sal Min</b>						
3	<b>175</b>		3A-B	3A-B			
4	<b>150</b>		4A-B	4A-B			
5	<b>125</b>	3-1	5	5			
6	<b>125</b>	3-2	6	6			
7	<b>125</b>	3-3	7	7			
8	<b>100</b>	4-1	8	8			
9	<b>100</b>	4-2	9	9			
10	<b>100</b>	4-3	10	10			
11	<b>75</b>	5-1	11	11			
12	<b>75</b>	5-2	12	12			
13	<b>75</b>	5-3	13	13			
14	<b>45</b>	6-1	14	14			
15	<b>45</b>	6-2	15	15			
16	<b>45</b>	6-3	16	16			
17	<b>25</b>	7-1	17	17	X		
18	<b>25</b>	7-2	18	18			
19	<b>25</b>	7-3	19	19			
20	<b>5</b>	8-1	20	20			
21	<b>5</b>	8-2	21	21			
22	<b>5</b>	8-3	22	22			
23							
24							

**Notes:**



# Hawaii Ocean Time-series

## HOT-258

### WOCE Deep Data Sheet

Station #	2	Date:	12/20/13	(HST)
Cast #	2	Time:	0500	(HST)
Operator(s):	AH,DS,BU			

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/ Alk	pH	DOC	Nutrient	Refridg. Si
1	<b>4800</b>	28	3.7				1	1
2	<b>4600</b>	29	3.8				2	2
3	<b>4500</b>	30,31,32	4.4	3A-B	1,2,3	3ABC	3A-B	3A-B
4	<b>4400</b>	33	4.0				4	4
5	<b>4200</b>	34	3.8				5	5
6	<b>4000</b>	35,36,37	4.4			6ABC	6A-B	6A-B
7	<b>3800</b>	38	4.0				7	7
8	<b>3600</b>	39	4.0				8	8
9	<b>3400</b>	40	3.9				9	9
10	<b>3200</b>	149	4.4				10	10
11	<b>3000</b>	42,43,44	4.1	11	4	11ABC	11A-B	11A-B
12	<b>2800</b>	45	4.1				12	12
13	<b>2600</b>	46	4.3				13	13
14	<b>2400</b>	47	4.4				14	14
15	<b>2200</b>	48	5.0				15	15
16	<b>2000</b>	179,50,51	5.1	16	5	16ABC	16A-B	16A-B
17	<b>1800</b>	52	5.0				17	17
18	<b>1600</b>	53	5.4				18	18
19	<b>1400</b>	54	5.8				19	19
20	<b>1200</b>	55	6.4				20	20
21	<b>1000</b>	56	7.0				21	21
22	<b>750</b>	57	8.9				22	22
23	<b>500</b>	58	24.2				23	23
24	<b>5</b>	59					24	

**Notes:**

# Hawaii Ocean Time-series

## HOT-258

### PO Shallow Data Sheet

Station # 2  
 Cast # 3  
 Operator(s): AH, BU, DS, SG

Date: 12/20/13 (HST)  
 Time: 1100 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/ Alk	pH	DOC	Nutrient	Refridg. Si
1	<b>1020</b>	60,61,62	6.5	1	1	1	1A-B	1A-B
2	<b>976</b>	63	6.5				2	2
3	<b>933</b>	64	6.5				3	3
4	<b>889</b>	65	6.6				4	4
5	<b>845</b>	66	6.7				5	5
6	<b>800</b>	67,68,69	7.2				6	6
7	<b>755</b>	70	7.1	7	2	7	7	7
8	<b>720</b>	71	7.2				8	8
9	<b>685</b>	72	7.4				9	9
10	<b>630</b>	73	7.9				10	10
11	<b>590</b>	74	7.8	11	3	11	11A-B	11A-B
12	<b>545</b>	75	8.4				12	12
13	<b>520</b>	76,77,78	9.3				13	13
14	<b>500</b>	79	8.9	14	4	14	14	14
15	<b>460</b>	80	9.4				15	15
16	<b>420</b>	81	10.2				16	16
17	<b>355</b>	82	11.5	17A-B	5,6	17	17	17
18	<b>315</b>	83,84,85	13.0				18	18
19	<b>263</b>	86	14.5	19	7	19	19	19
20	<b>210</b>	87	16.2				20	20
21	<b>155</b>	88	19.7				21A-B	
22	<b>120</b>	89	21.1				22	
23	<b>85</b>	90	23.5				23	
24	<b>70</b>	91	24.6				24	

**Notes:**

# Hawaii Ocean Time-series

## HOT- 258

### PC/PN Data Sheet

Station # 2 Date: 12-20-13 (HST)  
 Cast # 4 Time: 1400 (HST)  
 Operator(s): SC, KB, SG Pre-screen mesh size: 202 um  
 Blank #'s B1 B2 B3

Rosette Position	Desired Depth	Carboy #	Total Volume	Sample #	KD		
1	<b>1000</b>						
2	<b>Sal min</b>						
3	<b>350</b>	1	10	3			
4	<b>350</b>	2	10	4			
5	<b>250</b>	3	10	5			
6	<b>200</b>	4	10	6			
7	<b>175</b>	5	10	7			
8	<b>150</b>	6	10	8			
9	<b>125</b>	7,8	4,4	9A-B			
10	<b>100</b>	9	4	10			
11	<b>75</b>	10	4	11			
12	<b>45</b>	11	4	12			
13	<b>25</b>	12,13	4,4	13A-B	X		
14	<b>5</b>	14	4	14			
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

**Notes: KD samples taken from sample bottle 13 (beginning, middle, end)**  
**Sample #14, two filters, both in same dish**

# Hawaii Ocean Time-series

## HOT- 258

### Particulate Phosphorus Data Sheet

Station # 2 Date: 12-20-13 (HST)  
 Cast # 5 Time: 1700 (HST)  
 Operator(s): SC, KB, SG Pre-screen mesh size: 202 um  
 Blank #'s B1 B2 B3

Rosette Position	Desired Depth	Carboy #	Total Volume	Sample #			
1	<b>1000</b>						
2	<b>Sal min</b>						
3	<b>350</b>	1	10	3			
4	<b>350</b>	2	10	4			
5	<b>250</b>	3	10	5			
6	<b>200</b>	4	10	6			
7	<b>175</b>	5	10	7			
8	<b>150</b>	6	10	8			
9	<b>125</b>	7,8	4,4	9A-B			
10	<b>100</b>	9	4	10			
11	<b>75</b>	10	4	11			
12	<b>45</b>	11	4	12			
13	<b>25</b>	12,13	4,4	13A-B			
14	<b>5</b>	14	4	14			
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

**Notes: Sample #3 has two filters in tube; #4 filter was askew on holder, filtered quickly.**  
**Sample #6 filter was busted, filtered fast.**

# Hawaii Ocean Time-series

## HOT-258

### BEACH Shallow Data Sheet (1/2)

Station # 2  
 Cast # 6  
 Operator(s): SC, KB, SG, CS

Date: 12-20-13 (HST)  
 Time: 2000 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	DIC/ALK	Quay DIC	Keeling DIC	pH	DOC
1	<b>1000</b>	92	6.9					
2	<b>O<sub>2</sub> min</b>	93	7.6					
3	<b>Sal min</b>	94	9.5					
4	<b>200</b>	95	18.1	4			1	4
5	<b>175</b>	96	19.7					5
6	<b>165</b>	97	20.0					
7	<b>150</b>	98	20.5	7			2	7
8	<b>130</b>							
9	<b>125</b>	99	21.2					9
10	<b>115</b>	100	21.3					
11	<b>110</b>							
12	<b>100</b>	101,102,103	21.9	12			3	12
13	<b>90</b>							
14	<b>85</b>	104	23.0					
15	<b>75</b>	105	24.3	15			4	15
16	<b>60</b>							16
17	<b>45</b>	106	24.6	17			5	17
18	<b>35</b>							18
19	<b>25</b>	107	24.7	19			6	19
20	<b>25</b>				20			
21	<b>25</b>							
22	<b>15</b>							22
23	<b>5</b>	108	24.6	23A-B			7,8	23
24	<b>5</b>				24	24A-B		

**Notes: Keeling 24A = 210715 @2142**  
**Keeling 24B = 210716 @2144**

# Hawaii Ocean Time-series

## HOT-258

### BEACH Shallow Data Sheet (2/2)

Station # 2

Date: 12-20-13 (HST)

Cast # 6

Time: 2000 (HST)

Operator(s): SC, KB, SG, CS

Rosette Position	Desired Depth	Nutrient	Refridg. Si	LLN	LLP	SF-S		
1	<b>1000</b>							
2	<b>O<sub>2</sub> min</b>							
3	<b>Sal min</b>							
4	<b>200</b>	4	4					
5	<b>175</b>	5		5	5			
6	<b>165</b>			6				
7	<b>150</b>	7		7A-B	7			
8	<b>130</b>			8				
9	<b>125</b>	9A-B		9	9			
10	<b>115</b>			10	10			
11	<b>110</b>			11				
12	<b>100</b>	12		12A-B	12			
13	<b>90</b>			13				
14	<b>85</b>			14	14			
15	<b>75</b>	15		15	15			
16	<b>60</b>	16		16	16			
17	<b>45</b>	17A-B		17	17			
18	<b>35</b>	18		18				
19	<b>25</b>	19		19	19			
20	<b>25</b>							
21	<b>25</b>					X		
22	<b>15</b>	22		22				
23	<b>5</b>	23		23A-B	23			
24	<b>5</b>							

Notes:

# Hawaii Ocean Time-series

## HOT-258

### PUR Data Sheet

Station # 2  
 Cast # 7  
 Operator(s): SC, KB

Date: 12-20-13 (HST)  
 Time: 2300 (HST)

Rosette Position	Desired Depth	Carboy #	Total Volume	PUR	SF-S			
1	<b>1000</b>							
2	<b>Sal Min</b>							
3	<b>175</b>	1	10	3				
4	<b>150</b>	2	10	4				
5	<b>125</b>	7,8	4,4	5A-B				
6	<b>100</b>	9	4	6				
7	<b>75</b>	10	4	7				
8	<b>45</b>	11,12	4,4	8A-B				
9	<b>25</b>	3	10	9				
10	<b>25</b>				X			
11	<b>5</b>	4	10	11				
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

**Notes:**

# Hawaii Ocean Time-series

## HOT- 258

### Gas Array Experiment Data Sheet

Station # 2  
 Cast # 8  
 Operator(s): SC, KB

Date: 12-21-13 (HST)  
 Time: 0200 (HST)

Rosette Position	Desired Depth	15N2	SF-S				
1	<b>1000</b>						
2	<b>Sal Min</b>						
3	<b>125</b>	X					
4	<b>125</b>	X					
5	<b>100</b>	X					
6	<b>100</b>	X					
7	<b>75</b>	X					
8	<b>75</b>	X					
9	<b>45</b>	X					
10	<b>45</b>	X					
11	<b>25</b>	X					
12	<b>25</b>	X					
13	<b>25</b>		X				
14	<b>5</b>	X					
15	<b>5</b>	X					
16							
17							
18							
19							
20							
21							
22							
23							
24							

**Notes:**  
**BOTTLE # 7,13 VENT OPENED**



# Hawaii Ocean Time-series

## HOT-258

### OPEN CAST Data Sheet

Station # 2  
 Cast # 9  
 Operator(s): AH,DS,BU

Date: 12/21/13 (HST)  
 Time: 0500 (HST)

Rosette Position	Desired Depth	KD	Salts	SF-S			
1	<b>1000</b>		X				
2	<b>Sal Min</b>		X				
3	<b>200</b>	X					
4	<b>175</b>	X					
5	<b>160</b>	X					
6	<b>150</b>	X					
7	<b>145</b>	X					
8	<b>140</b>	X					
9	<b>135</b>	X					
10	<b>130</b>	X					
11	<b>125</b>	X					
12	<b>120</b>	X					
13	<b>115</b>	X					
14	<b>110</b>	X					
15	<b>105</b>	X					
16	<b>100</b>	X					
17	<b>95</b>	X					
18	<b>90</b>	X					
19	<b>85</b>	X					
20	<b>75</b>	X					
21	<b>65</b>	X					
22	<b>45</b>	X					
23	<b>25</b>	X		X			
24	<b>5</b>	X	X				

**Notes:**

# Hawaii Ocean Time-series

## HOT- 258

### Particulate Silica Data Sheet

Station # 2 Date: 12/21/13 (HST)  
 Cast # 10 Time: 0800 (HST)  
 Operator(s): AH,DS,BU,SG Pre-screen mesh size: none  
 Blank # B1, B2, B3

Rosette Position	Desired Depth	Carboy #	Total Volume	Sample #	MC	SF-S	
1	<b>1000</b>						
2	<b>Sal min</b>						
3	<b>175</b>	7	4	3			
4	<b>175</b>				X		
5	<b>150</b>	8	4	5			
6	<b>150</b>				X		
7	<b>125</b>	9,10	4,4	7A-B			
8	<b>125</b>				X		
9	<b>100</b>	11	4	9			
10	<b>100</b>				X		
11	<b>75</b>	12	4	11			
12	<b>75</b>				X		
13	<b>45</b>	13	4	13			
14	<b>45</b>				X		
15	<b>25</b>	14,15	4,4	15A-B			
16	<b>25</b>				X		
17	<b>25</b>					X	
18	<b>5</b>	16	4	17			
19	<b>5</b>				X		
20							
21							
22							
23							
24							

Notes:

# Hawaii Ocean Time-series

## HOT- 258

### OPEN Data Sheet

Station # 2  
 Cast # 11  
 Operator(s): AH,DS,BU

Date: 12/21/13 (HST)  
 Time: 1110 (HST)

Rosette Position	Desired Depth	CS	SF-S				
1	<b>1000</b>						
2	<b>Sal Min</b>						
3	<b>175</b>	X					
4	<b>175</b>	X					
5	<b>150</b>	X					
6	<b>150</b>	X					
7	<b>125</b>	X					
8	<b>125</b>	X					
9	<b>100</b>	X					
10	<b>100</b>	X					
11	<b>75</b>	X					
12	<b>75</b>	X					
13	<b>45</b>	X					
14	<b>45</b>	X					
15	<b>25</b>	X					
16	<b>25</b>	X					
17	<b>25</b>		X				
18	<b>5</b>	X					
19	<b>5</b>	X					
20							
21							
22							
23							
24							

Notes:

# Hawaii Ocean Time-series

## HOT- 258

### ATP Data Sheet

Station #	2	Date:	12-21-13	(HST)
Cast #	12	Time:	1443	(HST)
Operator(s):	SC, KB, SG	Pre-screen mesh size:	202um	
Blank #'s	28, 29, 30			

Rosette Position	Desired Depth	ATP Tube #'s	Volume Filtered	Carboy #	MC	SW	KB	SF-S
1	<b>1000</b>					X		
2	<b>900</b>					X		
3	<b>800</b>					X		
4	<b>770</b>				X			
5	<b>700</b>					X	X	
6	<b>600</b>					X		
7	<b>500</b>					X		
8	<b>500</b>				X			
9	<b>Sal min</b>							
10	<b>400</b>					X		
11	<b>350</b>	1 – 3	3x2	1				
12	<b>300</b>					X		
13	<b>300</b>				X			
14	<b>250</b>	4 – 6	3x2	2				
15	<b>200</b>					X		
16	<b>200</b>				X			
17	<b>150</b>	7 – 9	3x1	7				
18	<b>125</b>	10 – 12	3x1	8				
19	<b>100</b>	13 – 15	3x1	9				
20	<b>75</b>	16 – 18	3x1	10				
21	<b>45</b>	19 – 21	3x1	11				
22	<b>25</b>	22 – 24	3x1	12				
23	<b>25</b>							X
24	<b>5</b>	25 - 27	3x1	13				

**Notes: Tube 2 and 3 went dry at end  
Tube 15 did not boil.**

# Hawaii Ocean Time-series

## HOT-258

### OPEN CAST Data Sheet

Station # 2  
 Cast # 13  
 Operator(s): SC, KB, SG

Date: 12-21-13 (HST)  
 Time: 1700 (HST)

Rosette Position	Desired Depth	MC	SW	SF-S			
1	<b>1000</b>						
2	<b>Sal Min</b>						
3	<b>175</b>	X	X				
4	<b>150</b>	X	X				
5	<b>125</b>	X	X				
6	<b>100</b>	X	X				
7	<b>75</b>	X	X				
8	<b>45</b>	X	X				
9	<b>25</b>	X	X				
10	<b>25</b>			X			
11	<b>5</b>	X	X				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

**Notes:**

# Hawaii Ocean Time-series

## HOT-258

### HPLC & Chl *a*. Bottle Data Sheet

Station # 2  
 Cast # 14  
 Operator(s): SC, KB

Date: 12-21-13 (HST)  
 Time: 2010 (HST)

Rosette Position	Desired Depth	Carboy #	Total Volume	HPLC	Chl <i>a</i> .	SLIDES	KD	
1	<b>1000</b>							
2	<b>Sal min</b>							
3	<b>175</b>	1	10	3	3			
4	<b>175</b>					X		
5	<b>150</b>	2	10	5	5			
6	<b>150</b>					X		
7	<b>135</b>	7	4	7	7A-B			
8	<b>125</b>	8,9	4,4	8A-B	8			
9	<b>125</b>					X		
10	<b>115</b>	10	4	10	10			
11	<b>100</b>	11	4	11	11			
12	<b>100</b>					X		
13	<b>85</b>	12	4	13	13			
14	<b>75</b>	13	4	14	14			
15	<b>75</b>					X		
16	<b>60</b>	14	4	16	16A-B			
17	<b>45</b>	15,16	4,4	17A-B	17			
18	<b>45</b>					X		
19	<b>25</b>	3	10	19	19		X	
20	<b>25</b>					X		
21	<b>5</b>	4	10	21	21			
22	<b>5</b>					X		
23								
24								

**Notes: DO NOT PRE-SCREEN**  
**KD breakthrough experiment w/25m water**  
**Niskins 4,6,7, and 8 vents were open**

# Hawaii Ocean Time-series

## HOT-258

### WOCE Deep 2 Data Sheet

Station # 2  
 Cast # 15  
 Operator(s): SC, KB

Date: 12-21-13 (HST)  
 Time: 2300 (HST)

Rosette Position	Desired Depth	Oxygen	Sample Temp.	MC	KB			
1	<b>4800</b>	109	3.8					
2	<b>4500</b>	110,111,112	4.2					
3	<b>4000</b>	113,114,115	4.2					
4	<b>4000</b>			X				
5	<b>3000</b>	116,117,118	4.4					
6	<b>3000</b>			X				
7	<b>2000</b>	119,120,121	5.0					
8	<b>2000</b>			X				
9	<b>1000</b>			X				
10	<b>O2 min</b>	122,123,124	6.6					
11	<b>Sal min</b>	125	11.5					
12	<b>O2 max</b>	126	22.6					
13	<b>25</b>				X			
14	<b>5</b>	127	24.5					
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

Notes:

# Hawaii Ocean Time-series

## HOT- 258

### STATION 52 Data Sheet

Station # 52  
 Cast # 1  
 Operator(s): AH,DS,BU

Date: 12/22/13 (HST)  
 Time: 0900 (HST)

Rosette Position	Desired Depth	DIC/TA	pH	KB		
1	<b>25</b>			X		
2	<b>5</b>	2	1,2,3			
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

**Notes:**



# Hawaii Ocean Time-series

## HOT- 258

### STATION Kaena Data Sheet

Station # 6  
 Cast # 1  
 Operator(s): SC, KB

Date: 12-22-13 (HST)  
 Time: 2005 (HST)

Rosette Position	Desired Depth	Chl a.				
1	<b>2500</b>					
2	<b>2000</b>					
3	<b>1500</b>					
4	<b>1000</b>					
5	<b>500</b>					
6	<b>175</b>	6				
7	<b>150</b>	7				
8	<b>125</b>	8				
9	<b>100</b>	9				
10	<b>75</b>	10				
11	<b>45</b>	11				
12	<b>25</b>	12				
13	<b>5</b>	13				
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

Notes:

# Hawaii Ocean Time-series

## HOT-258

### Sediment Trap Data Sheet

Type of traps:	<u>PIT</u>	Date:	<u>12-19-13</u>
Operator(s):	<u>SC, BW, KB</u>	Wind:	<u></u>
Position in:	<u>22°44.994'N 158°3.230'W</u>	Sea State:	<u></u>

Time in:	150 m	<u>X</u>	Notes: 2319 Traps in water, 2323 array released
(HST)		<u></u>	
		<u></u>	
		<u></u>	

Operator(s):	<u>AH, DS, BU, BW</u>	Date:	<u>12/22/13</u>
Position out:	<u>22° 44.461 N 158° 3.694 W</u>	Wind:	<u></u>
Overall sea state:	<u></u>	Sea state:	<u></u>

Time Out:	150 m	<u>0700</u>	Notes:
(HST)		<u></u>	
		<u></u>	
		<u></u>	

# Data Sheet for Sediment Trap Volumes

Cruise #: 258

Analyst: AH

Directions: 1) Mark the traps with 2 lines

a) Line #1 is at the interface

b) Line #2 is 2" (5 cm) above the interface

2) Siphon off the top of the trap to Line #2 - 2" above the interface

3) Measure the distance from the bottom of the trap to Line #2  
2" above the interface and record the result in this table.

Trap Name	Depth (m)	Height (cm) at Line #2 (Top Line)	Volume (L) at top line = (Height in cm x 0.038)
A	150	36.3	
B	150	37.3	
C	150	38.0	
D	150	39.0	
E	150	39.2	
F	150	39.0	
G	150	38.0	
H	150	38.4	
I	150	37.0	
J	150	39.0	
K	150	40.0	
L	150	37.5	

# Hawaii Ocean Time-series

## HOT-258

### In Situ Primary Production Data Sheet

Operator(s): SC, KB, AH, DS, BW, BU

Date in: 12/20/13

Time in: 0436 (HST)

Date out: 12-20-13

Time out: 1905 (HST)

Incubation Depth	✓
175	✓
150	✓
125	✓
100	✓
75	✓
45	✓
25	✓
5	✓

Insertion Depth

Owner

Position in: 22° 45.012'N 158° 2.000'W

Position out: 22° 43.970'N 158° 2.246'W

Average weather condition during incubation: mostly sunny

Average sea state during incubation: 8-10ft swells

 Begin Inoculation \_\_\_\_\_  
 Filtration time \_\_\_\_\_

End Inoculation \_\_\_\_\_

# Hawaii Ocean Time-series

## HOT-258

### In Situ Gas Array Data Sheet

<b>Operators:</b> AH,BW,BU,DS	<b>Operators:</b> AH,BW,BU,DS
<b>Date Deployed:</b> 12/21/13	<b>Date Recovered:</b> 12/22/13
<b>Time (HST):</b> 0420	<b>Time (HST):</b> 0600
<b>Position:</b> 22° 42.555 N 158° 2.455 W	<b>Position:</b> 22° 42.008 N 158° 1.486W

#1 = FRACTION

#4 = WHOLE

### Nitrogen Fixation Sample Processing Sheet

Sample ID	Date Spiked	Time Spiked	Date Filtered	Time Filtered	Comments
3-1	12/21/13	0340	12/22/13	0630	
3-4	12/21/13	0342	12/22/13	0630	
4-1	12/21/13	0343	12/22/13	0630	
4-4	12/21/13	0344	12/22/13	0630	
5-1	12/21/13	0344	12/22/13	0630	
5-4	12/21/13	0347	12/22/13	0710	
6-1	12/21/13	0344	12/22/13	0630	
6-4	12/21/13	0342	12/22/13	0710	
7-1	12/21/13	0342	12/22/13	0630	
7-4	12/21/13	0341	12/22/13	0710	
8-1	12/21/13	0352	12/22/13	0630	26ml N2 water added
8-4	12/21/13	0338	12/22/13	0710	

Are samples also spiked with C13? ☐ Yes ☒ No

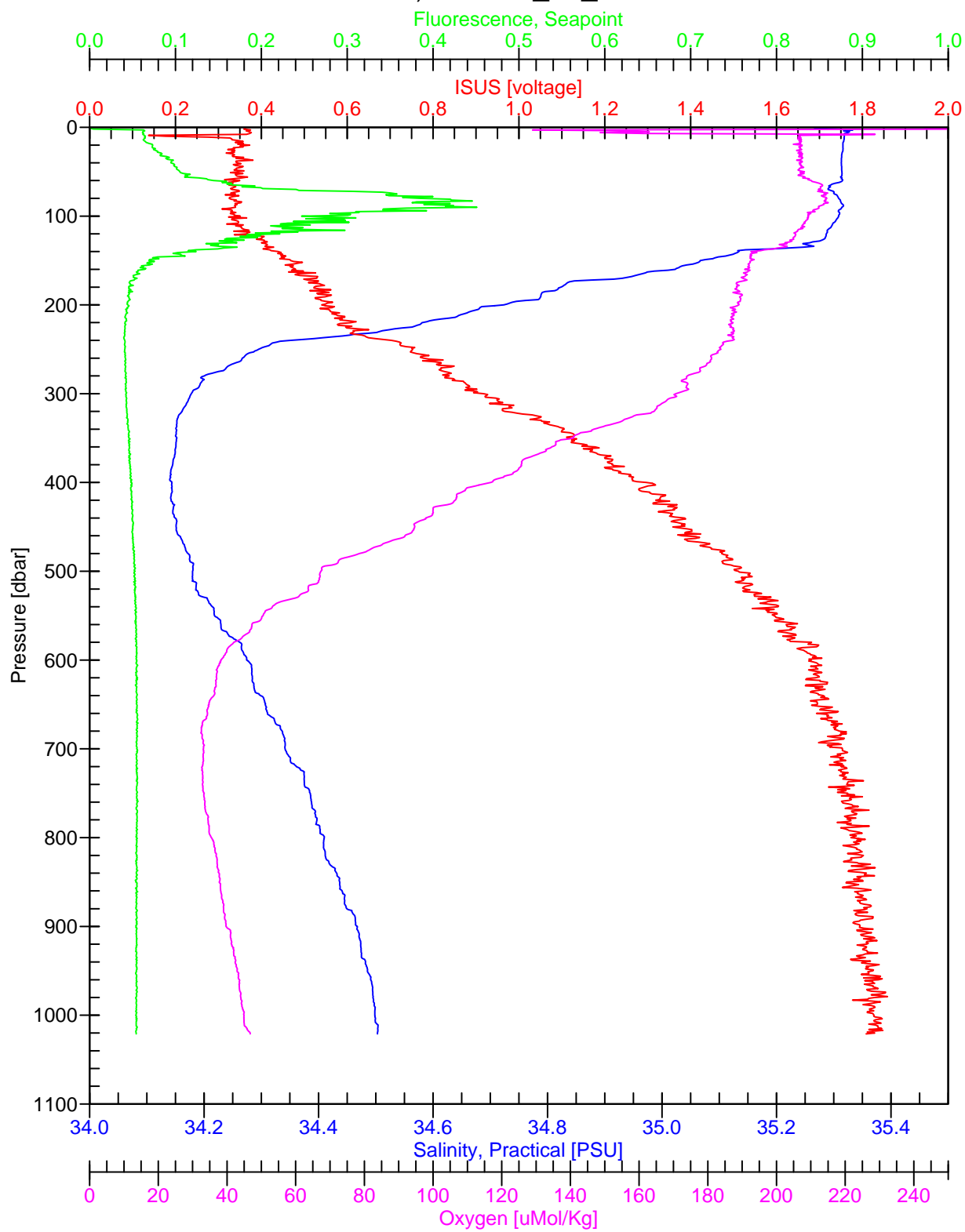
# Hawaii Ocean Time-series

## HOT 258

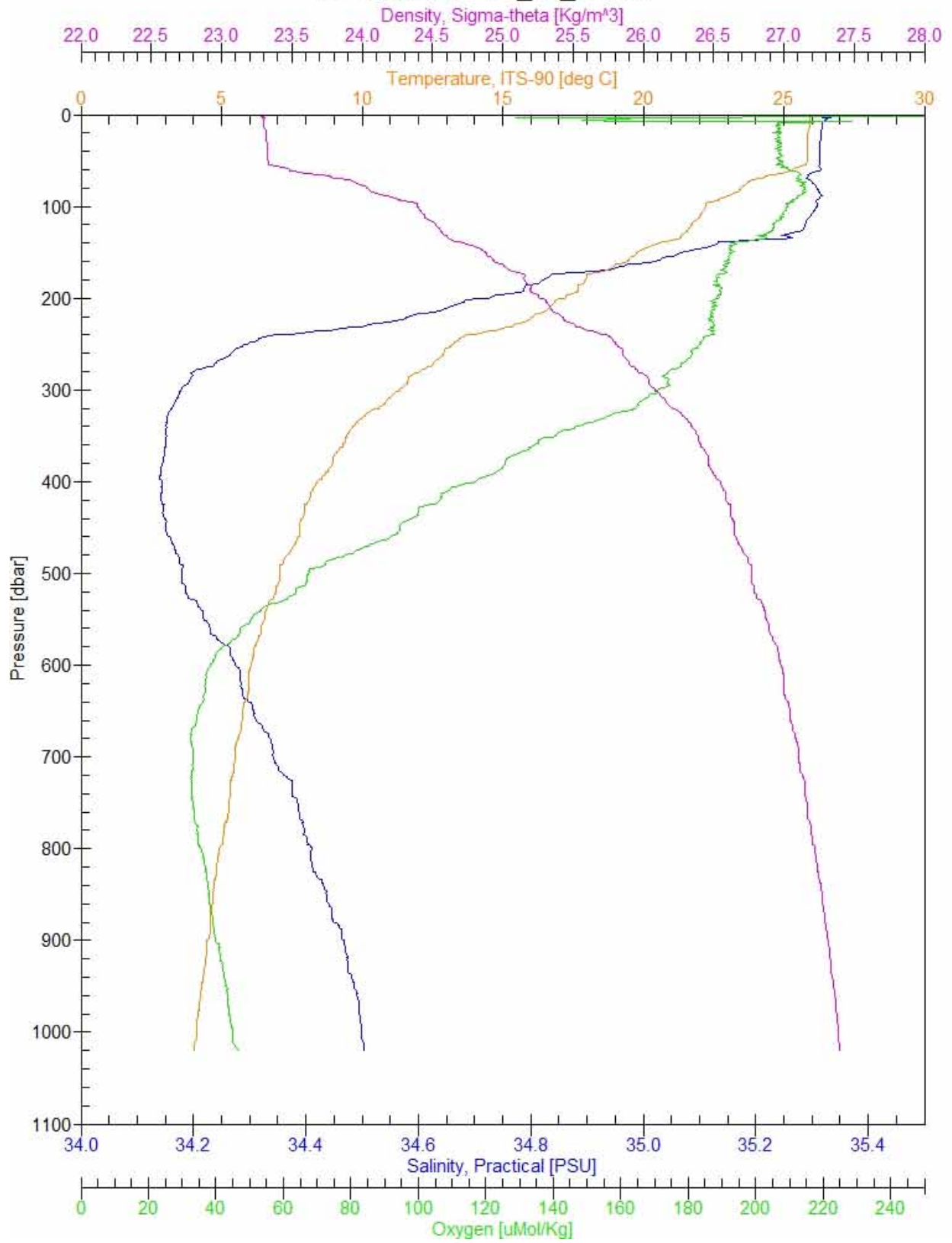
### Chlorophyll Grab Sample Sheet

[illegible]

# G-1000, hot-258\_s1\_c1.cnv

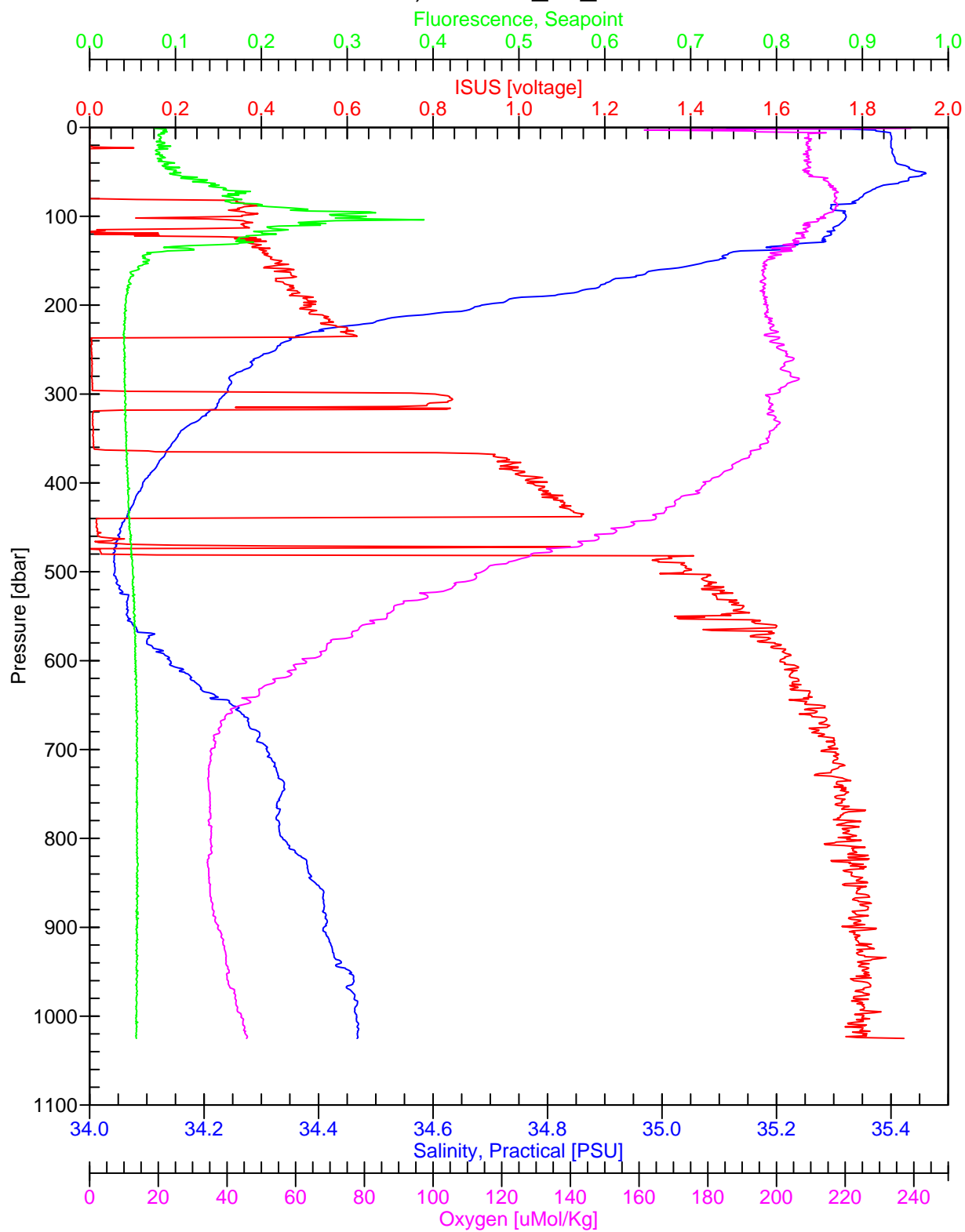


# W-1000, hot-258\_s1\_c1.cnv

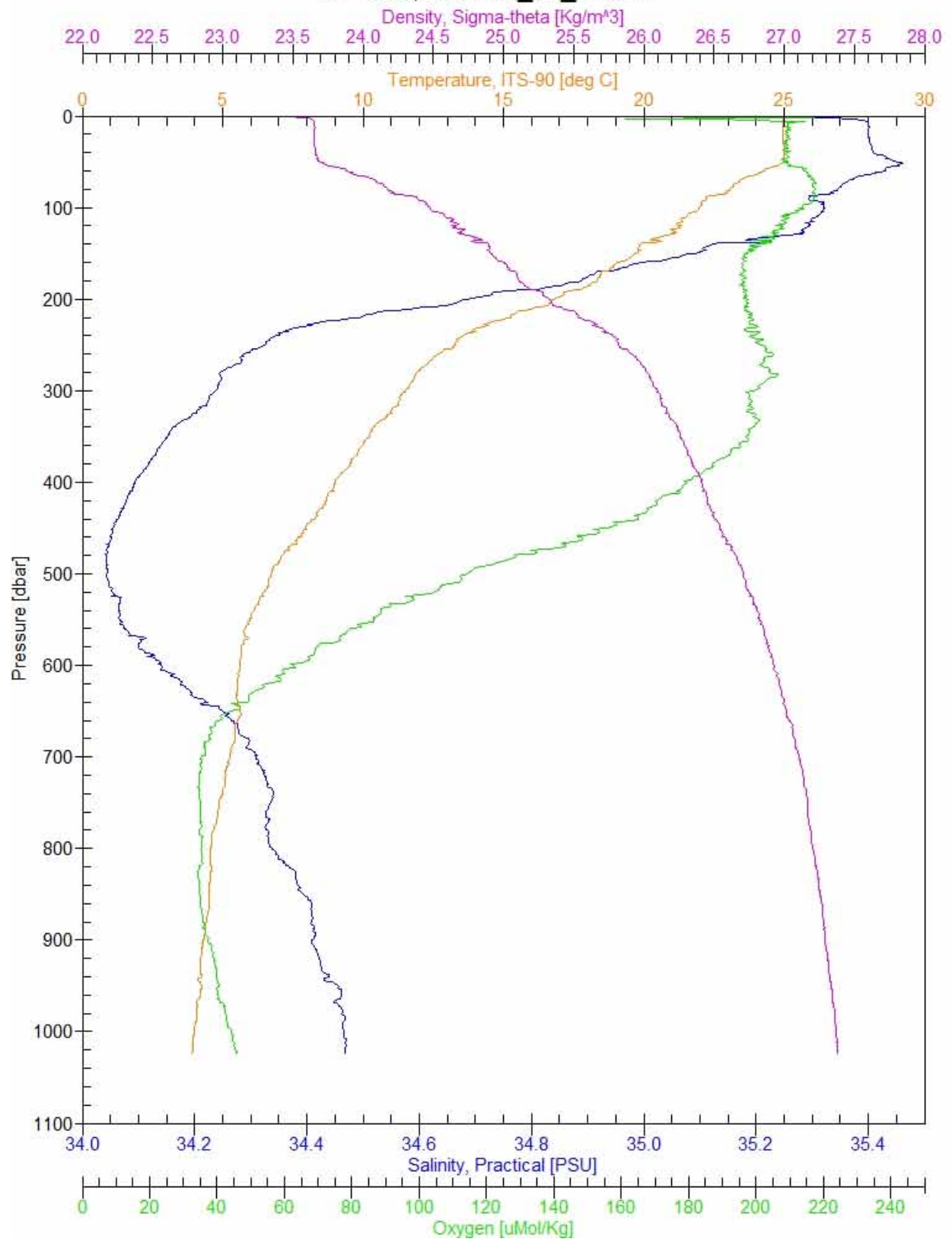




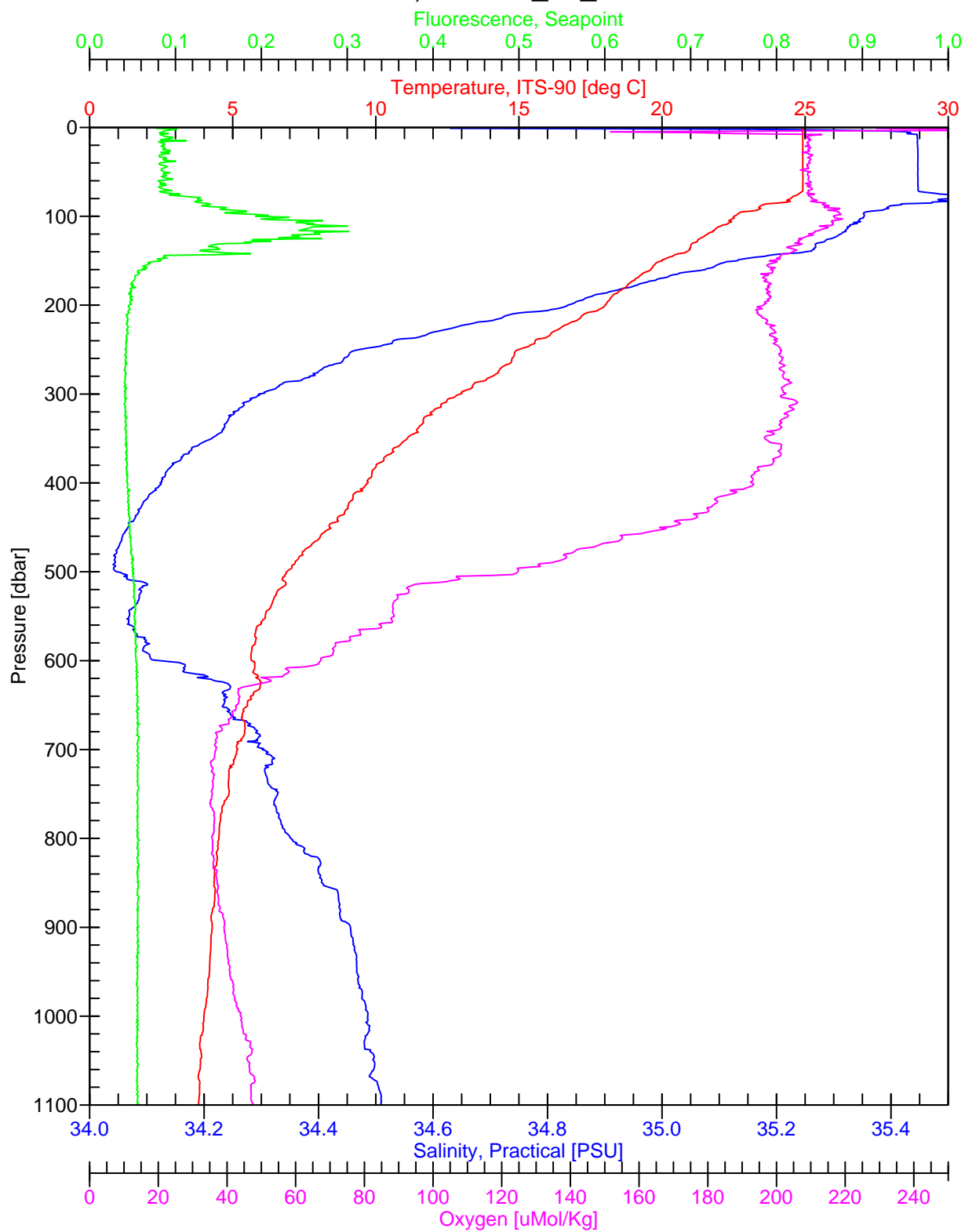
# G-1000, hot-258\_s2\_c1.cnv



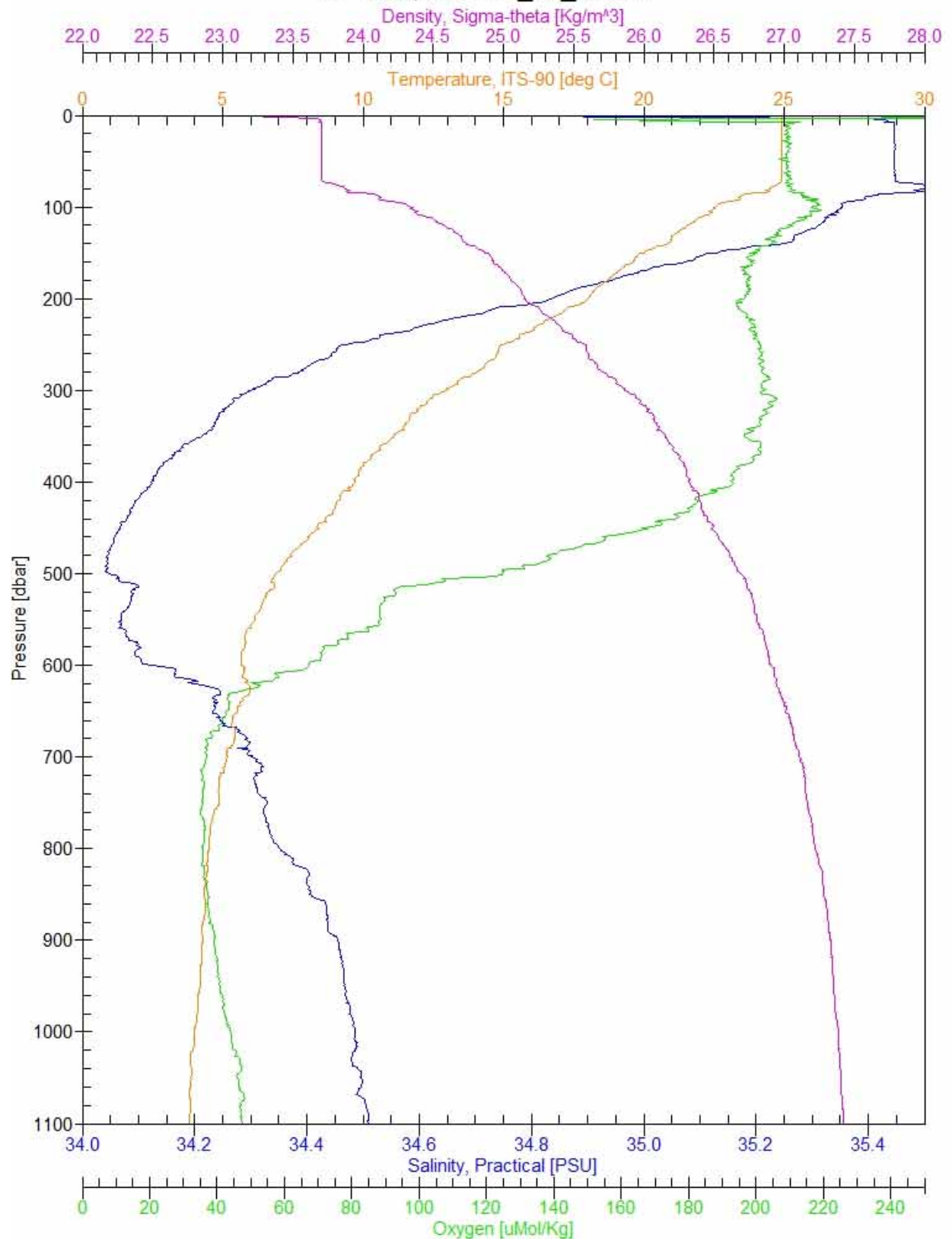
# W-1000, hot-258\_s2\_c1.cnv



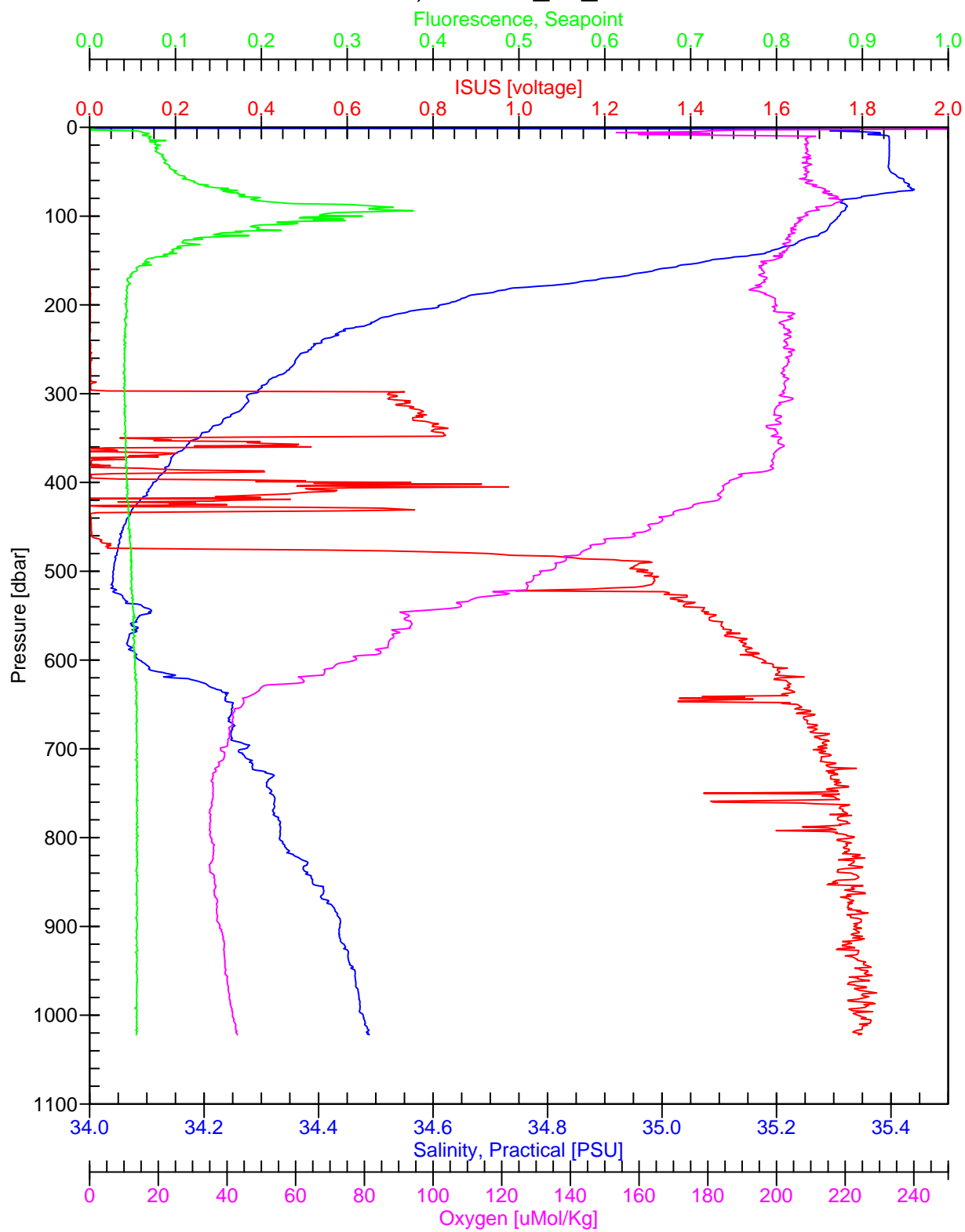
# G-1000, hot-258\_s2\_c2.cnv



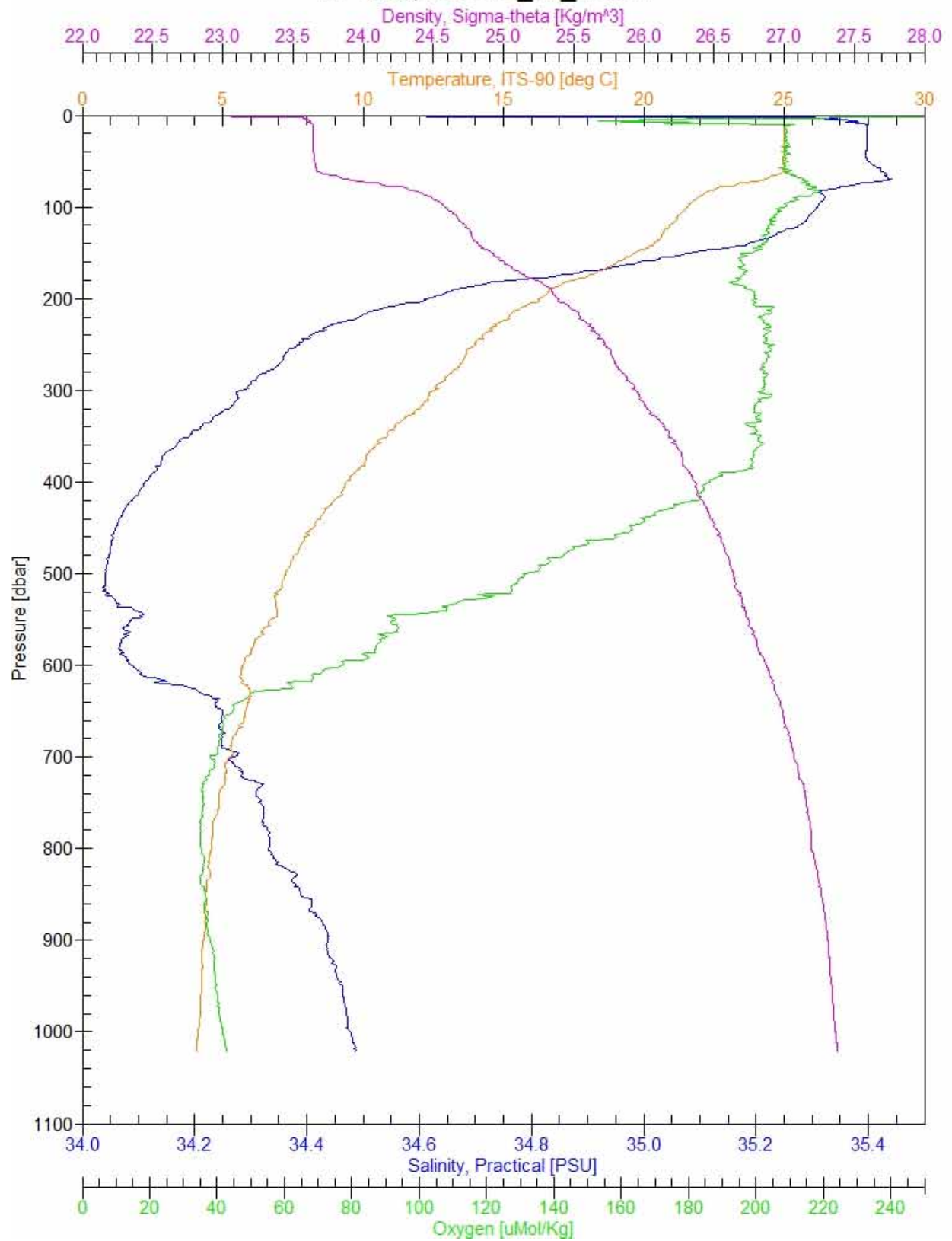
# W-1000, hot-258\_s2\_c2.cnv



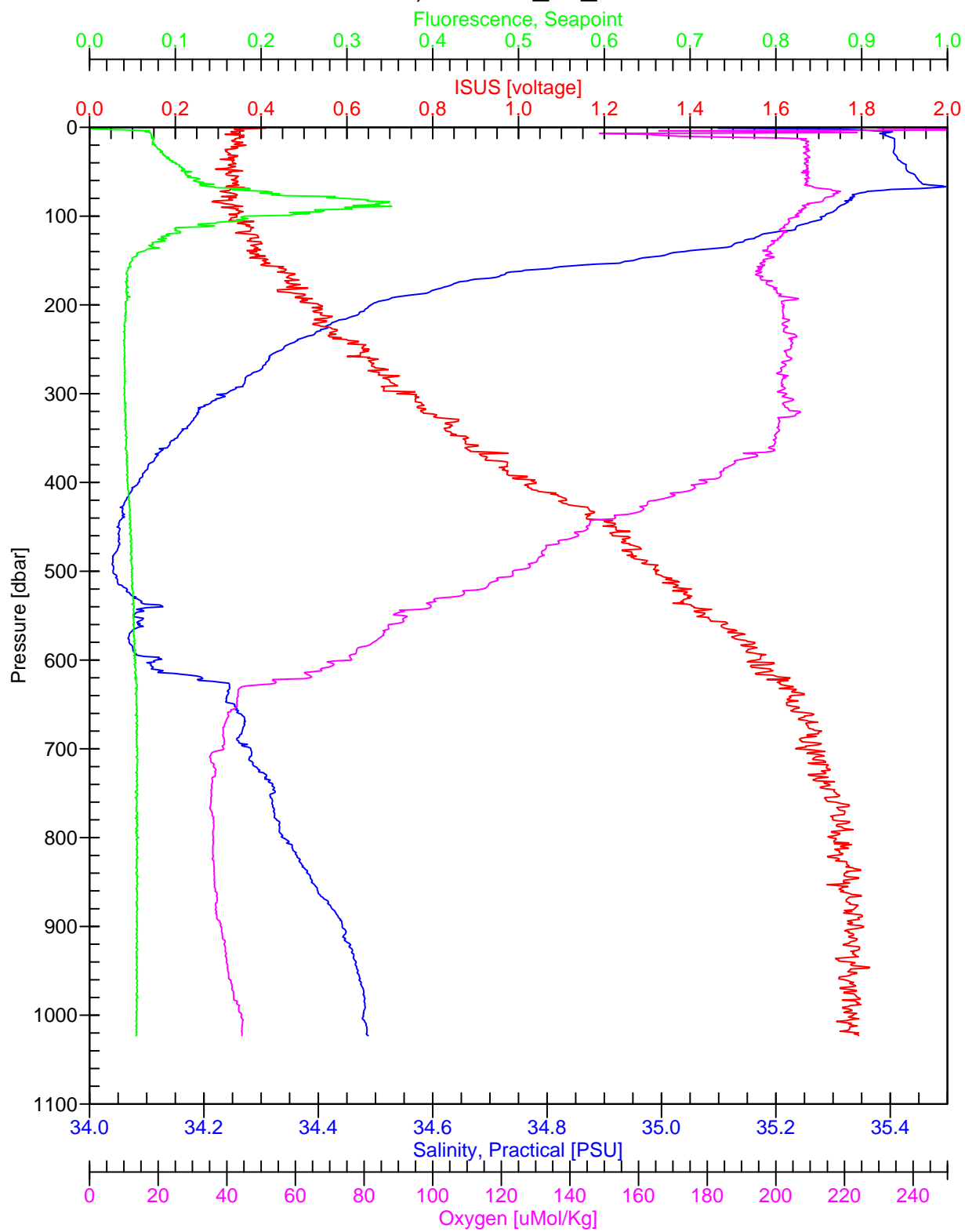
# G-1000, hot-258\_s2\_c3.cnv



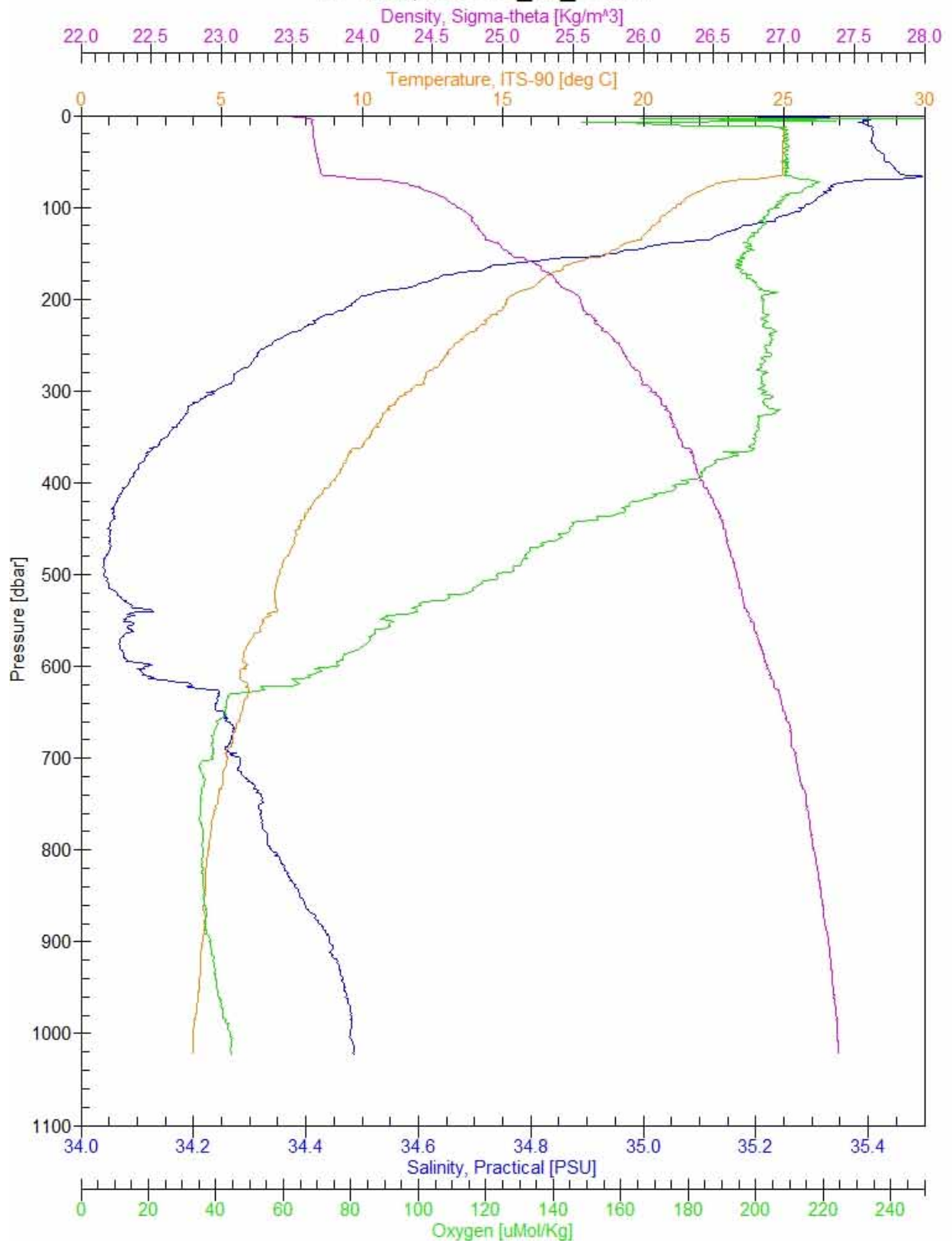
# W-1000, hot-258\_s2\_c3.cnv



# G-1000, hot-258\_s2\_c4.cnv

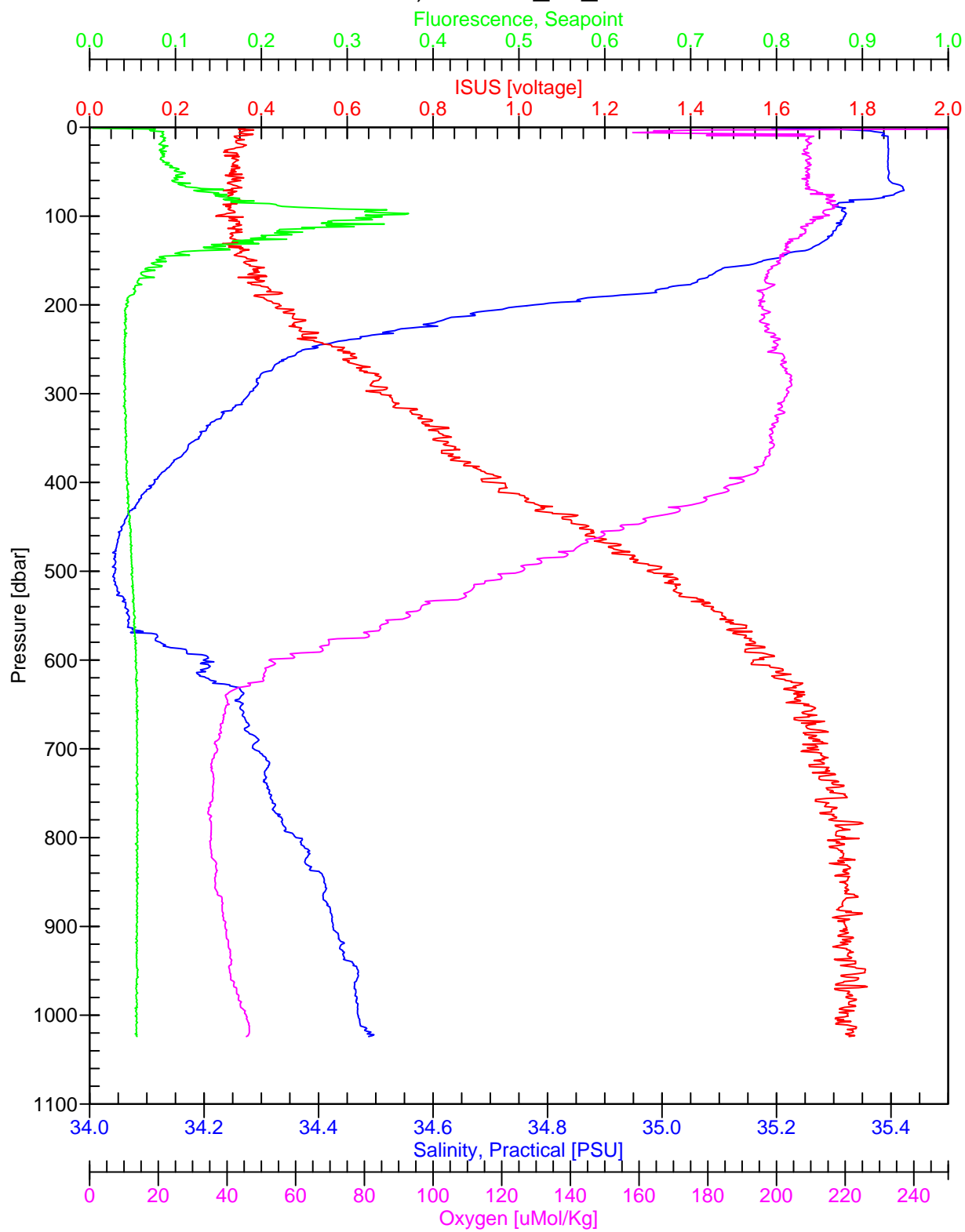


# W-1000, hot-258\_s2\_c4.cnv

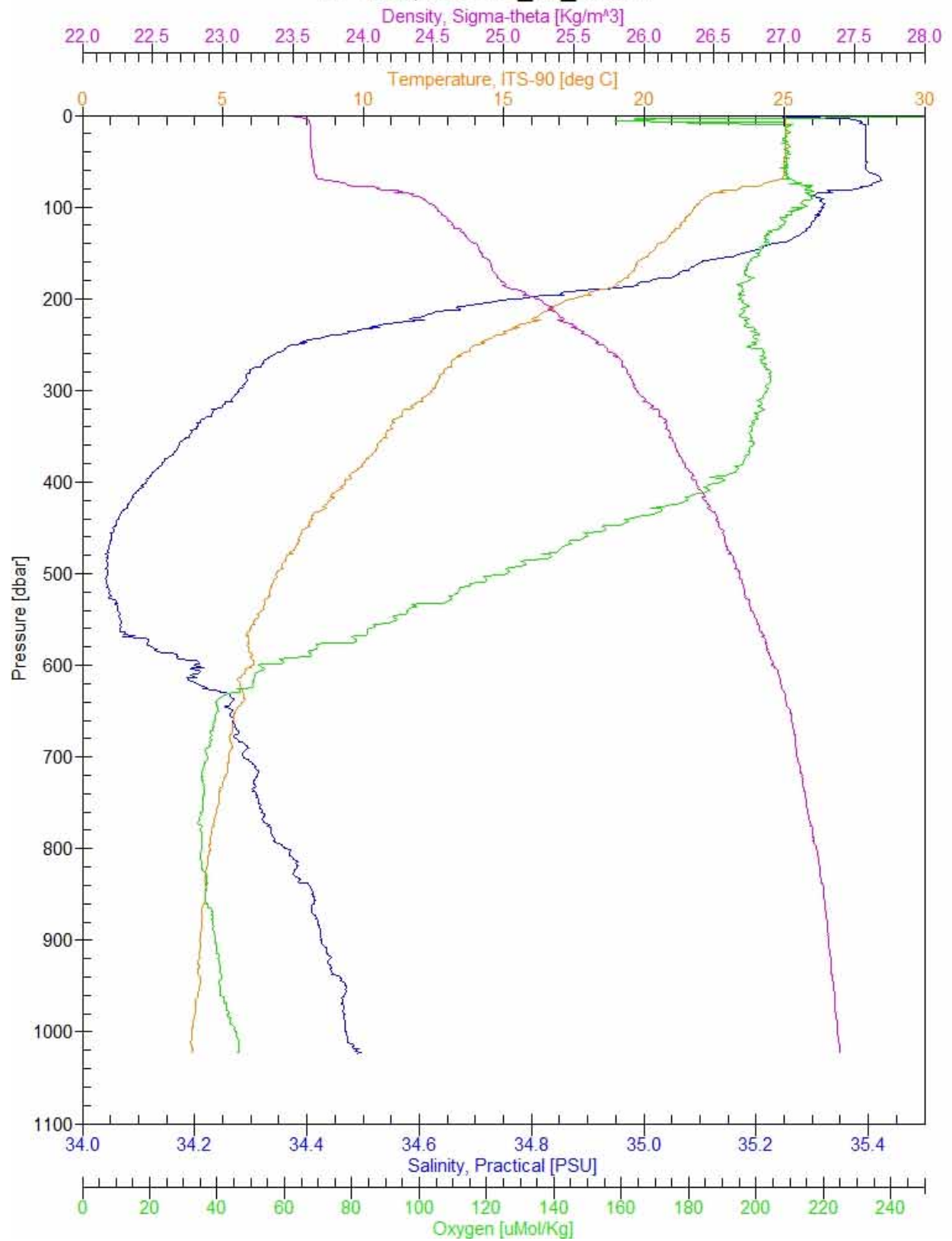




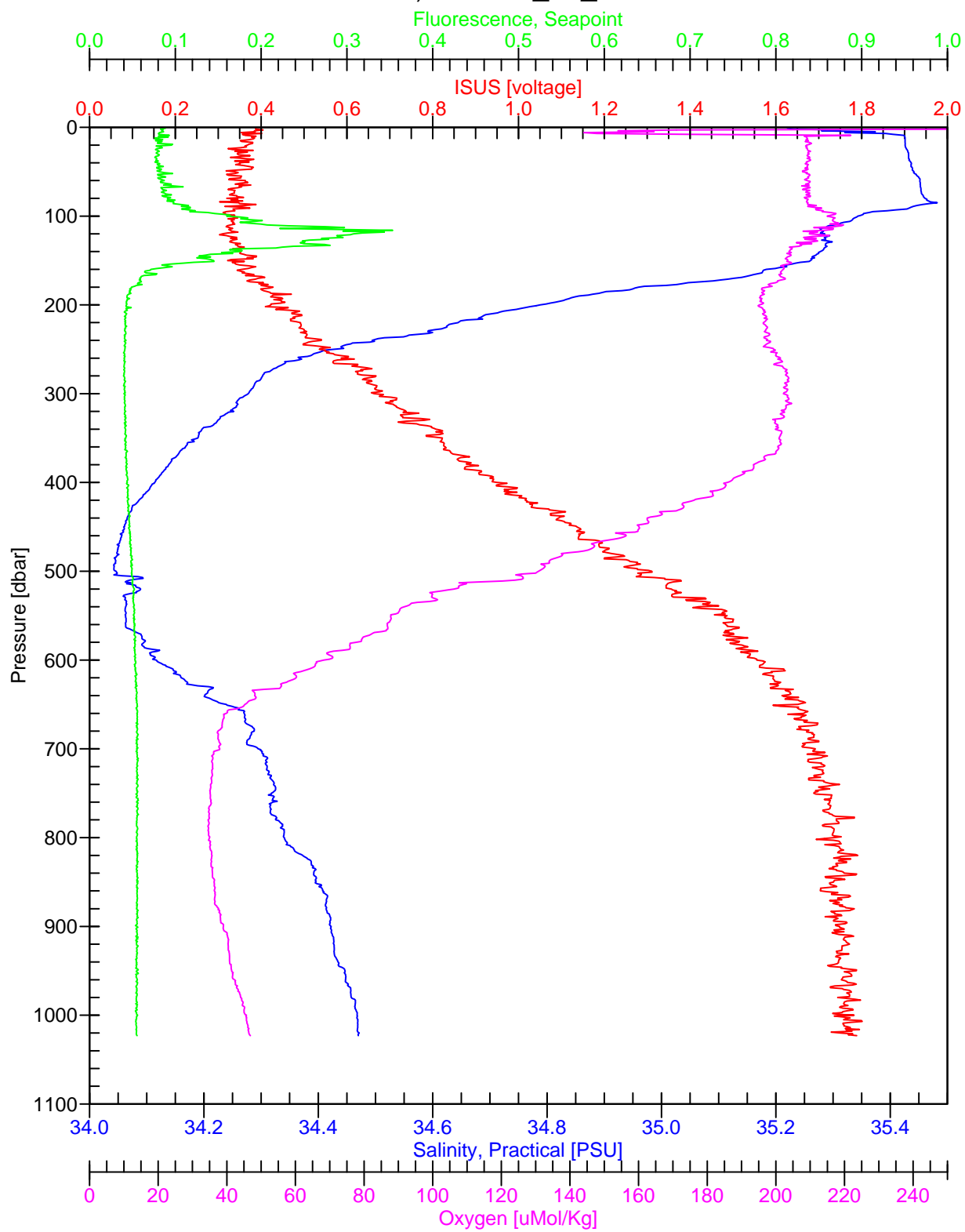
# G-1000, hot-258\_s2\_c5.cnv



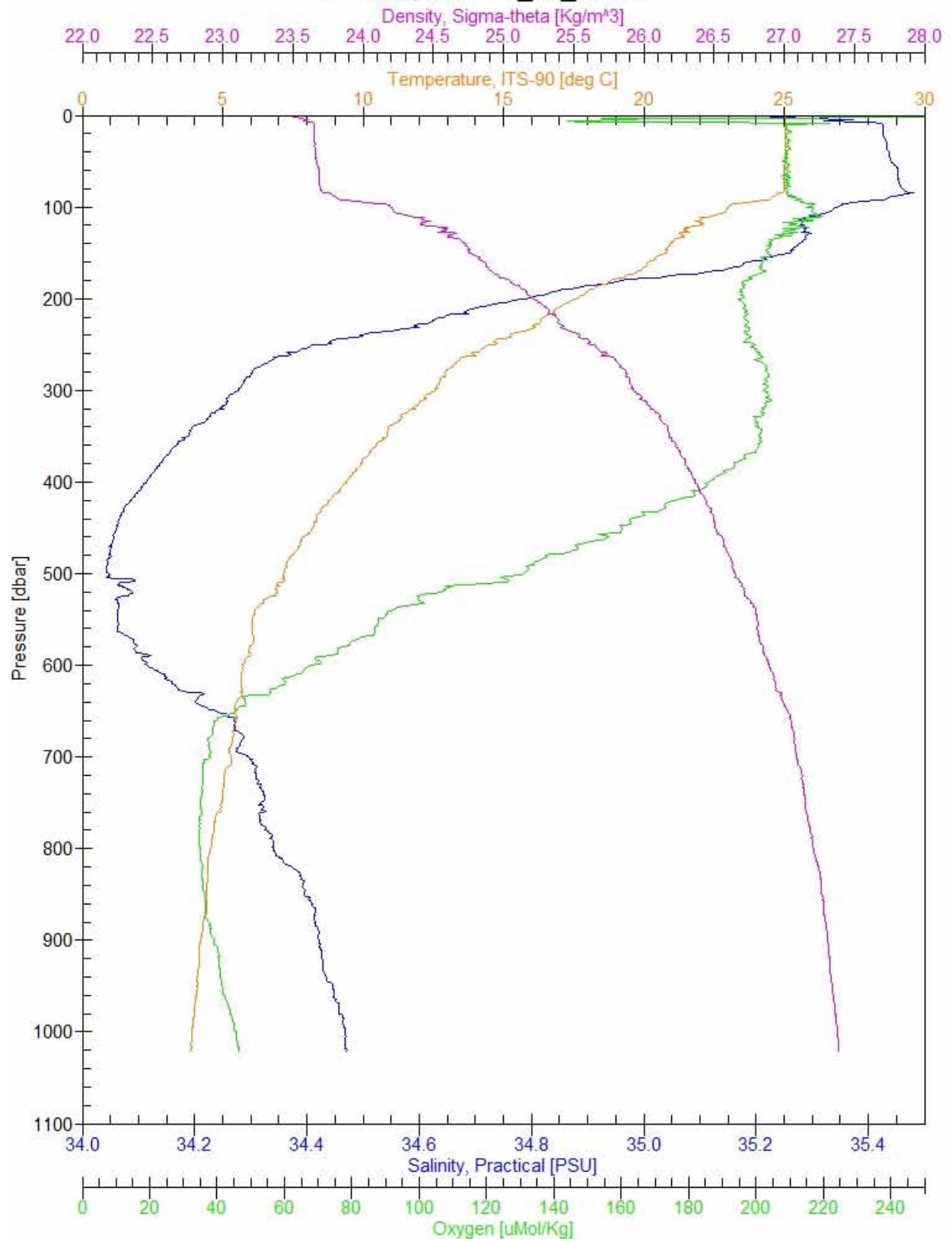
# W-1000, hot-258\_s2\_c5.cnv



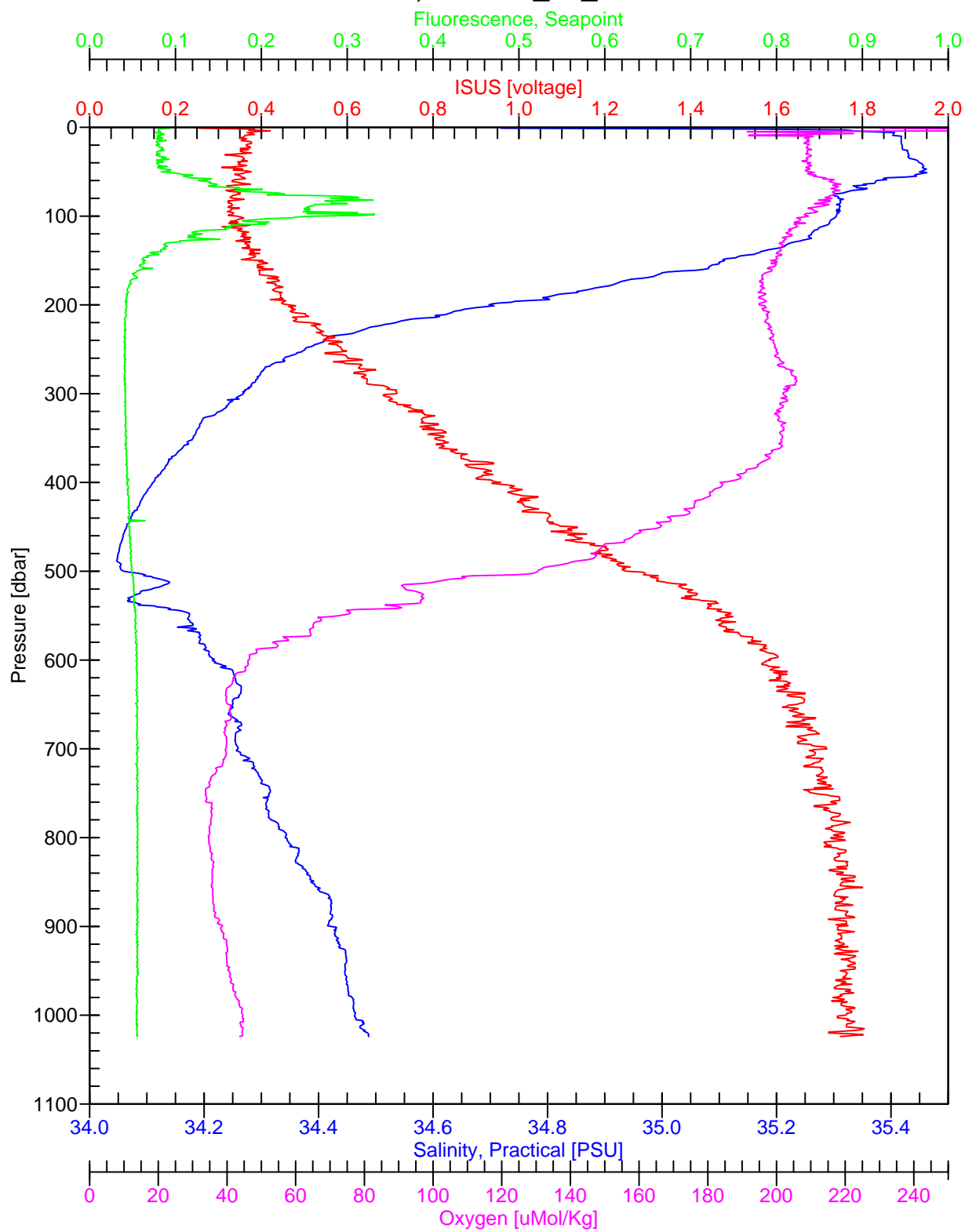
# G-1000, hot-258\_s2\_c6.cnv



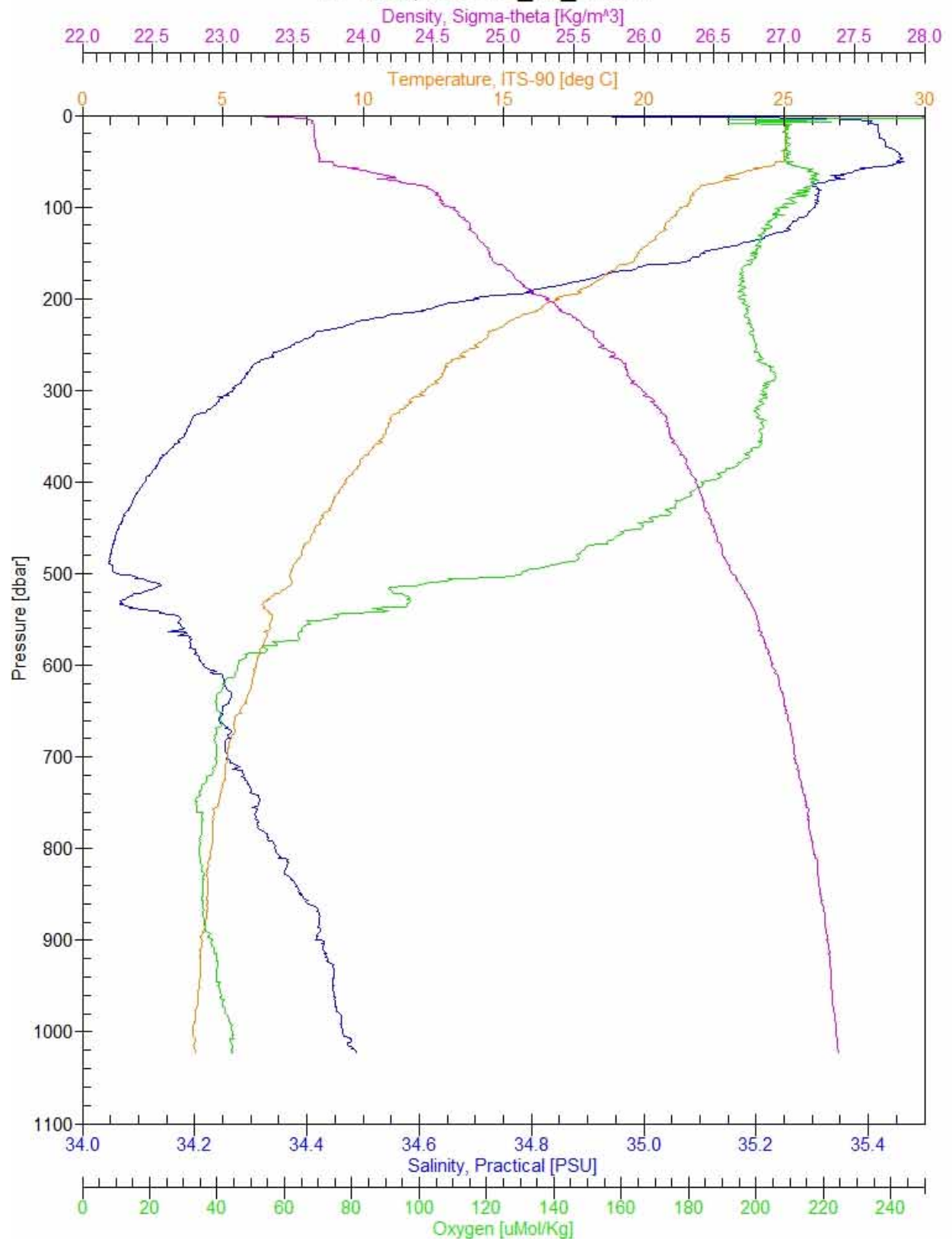
# W-1000, hot-258\_s2\_c6.cnv



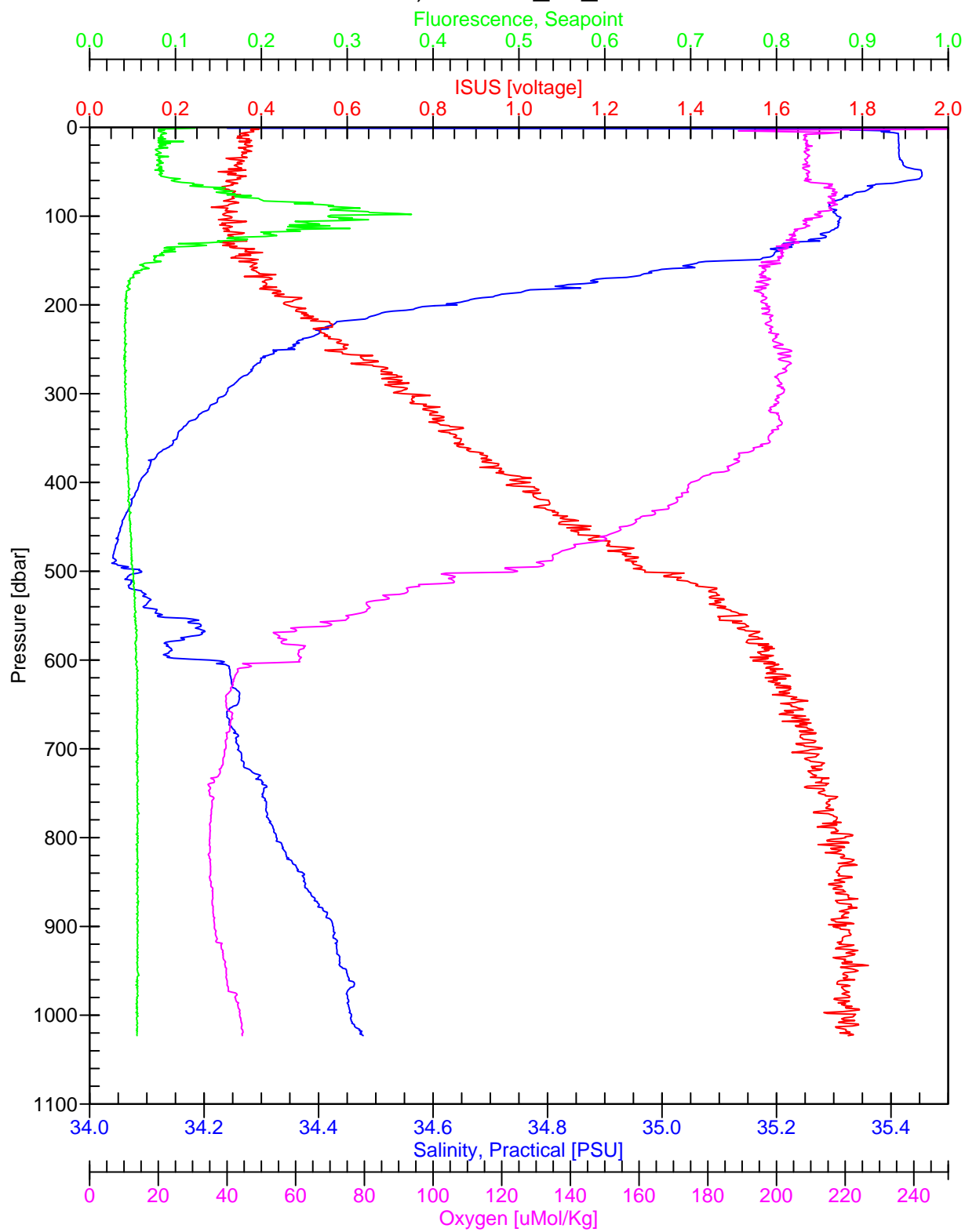
# G-1000, hot-258\_s2\_c7.cnv



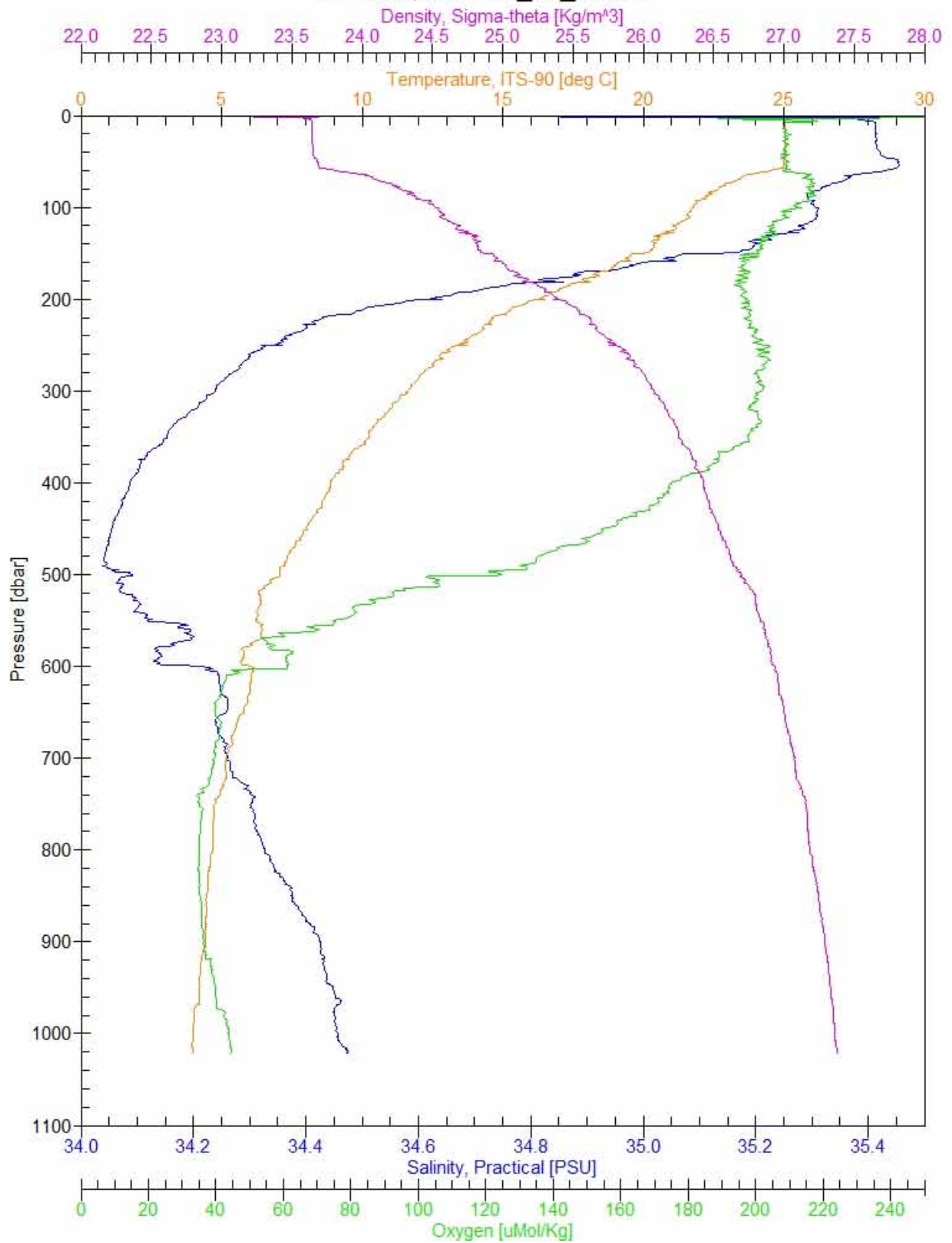
# W-1000, hot-258\_s2\_c7.cnv



# G-1000, hot-258\_s2\_c8.cnv

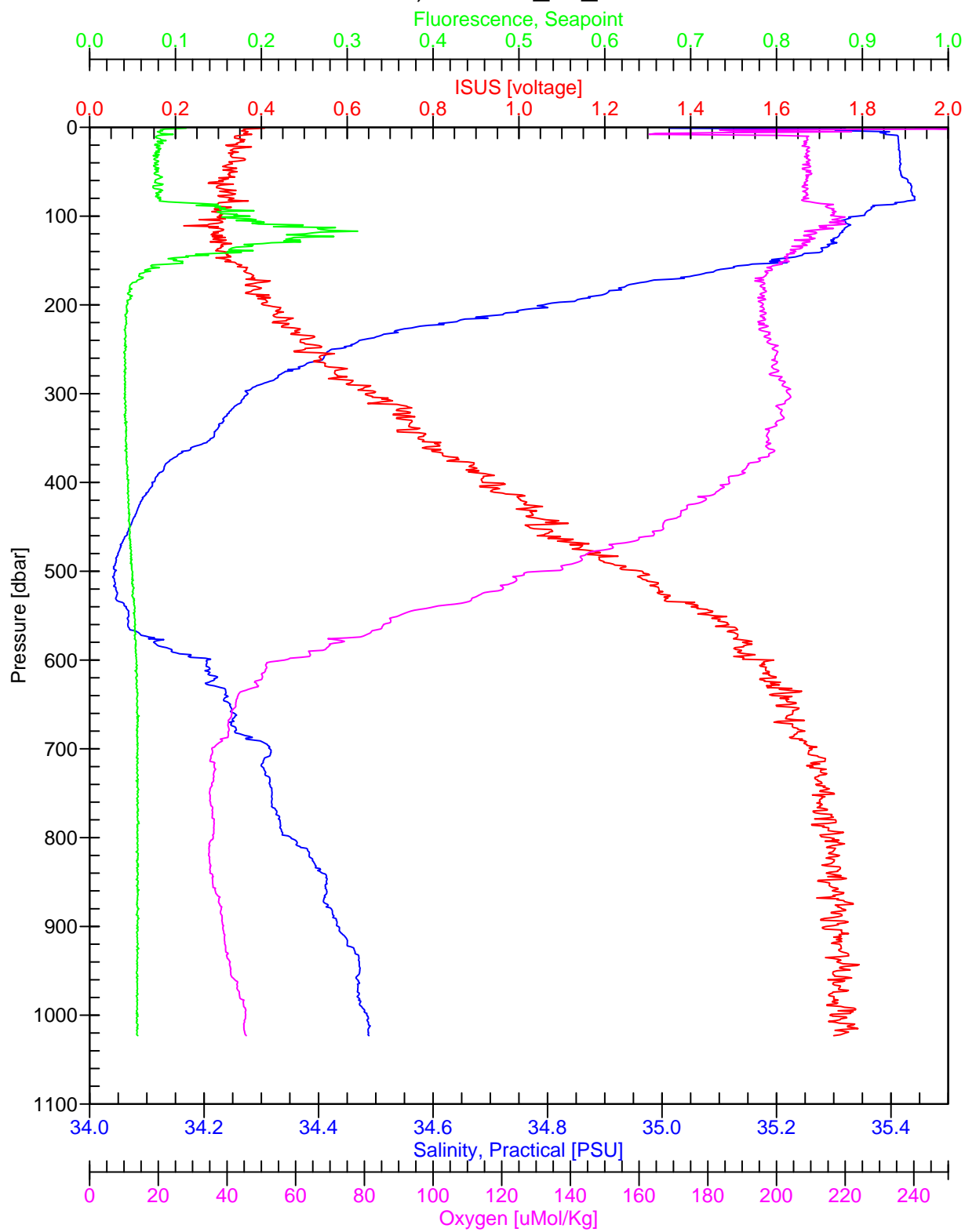


# W-1000, hot-258\_s2\_c8.cnv

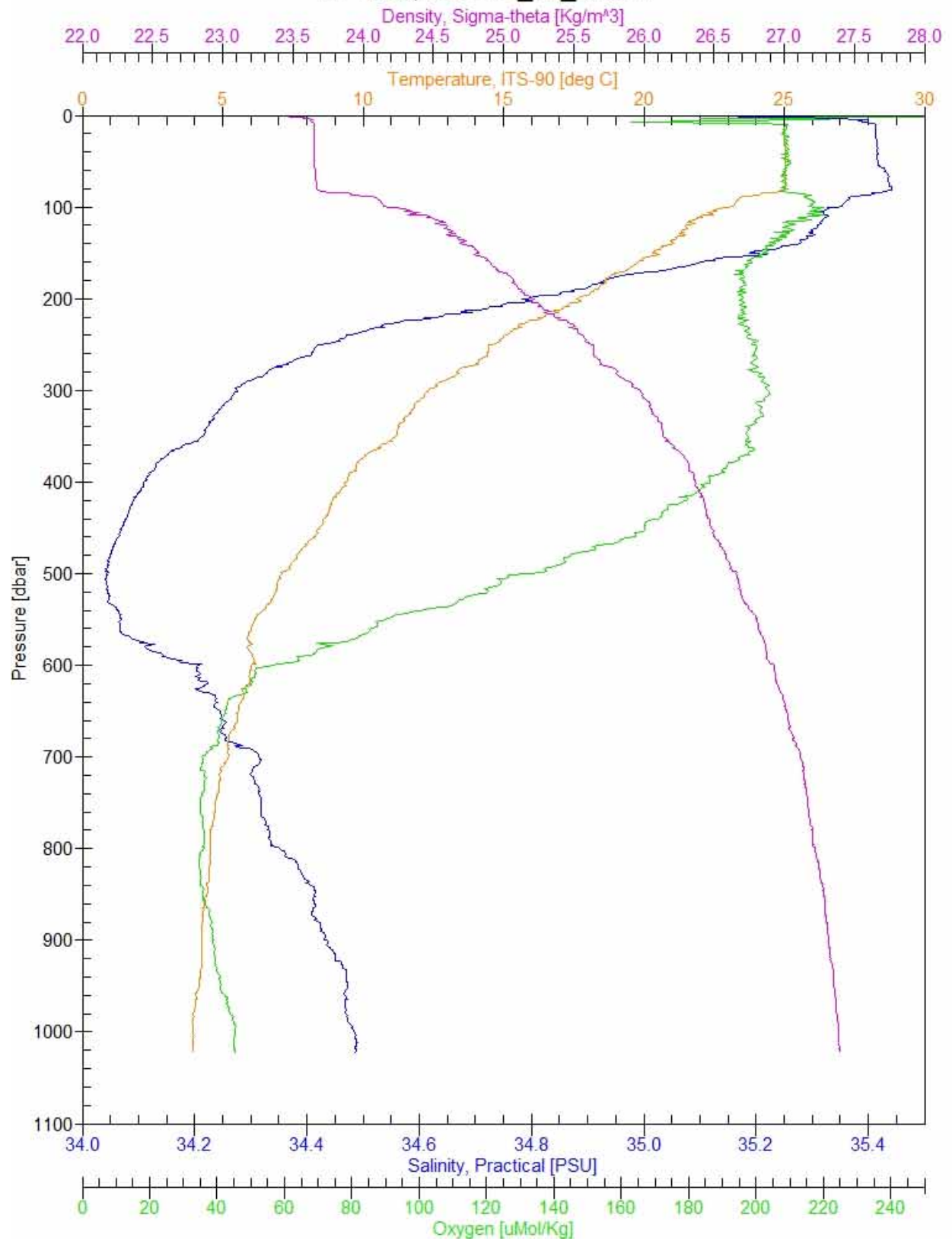




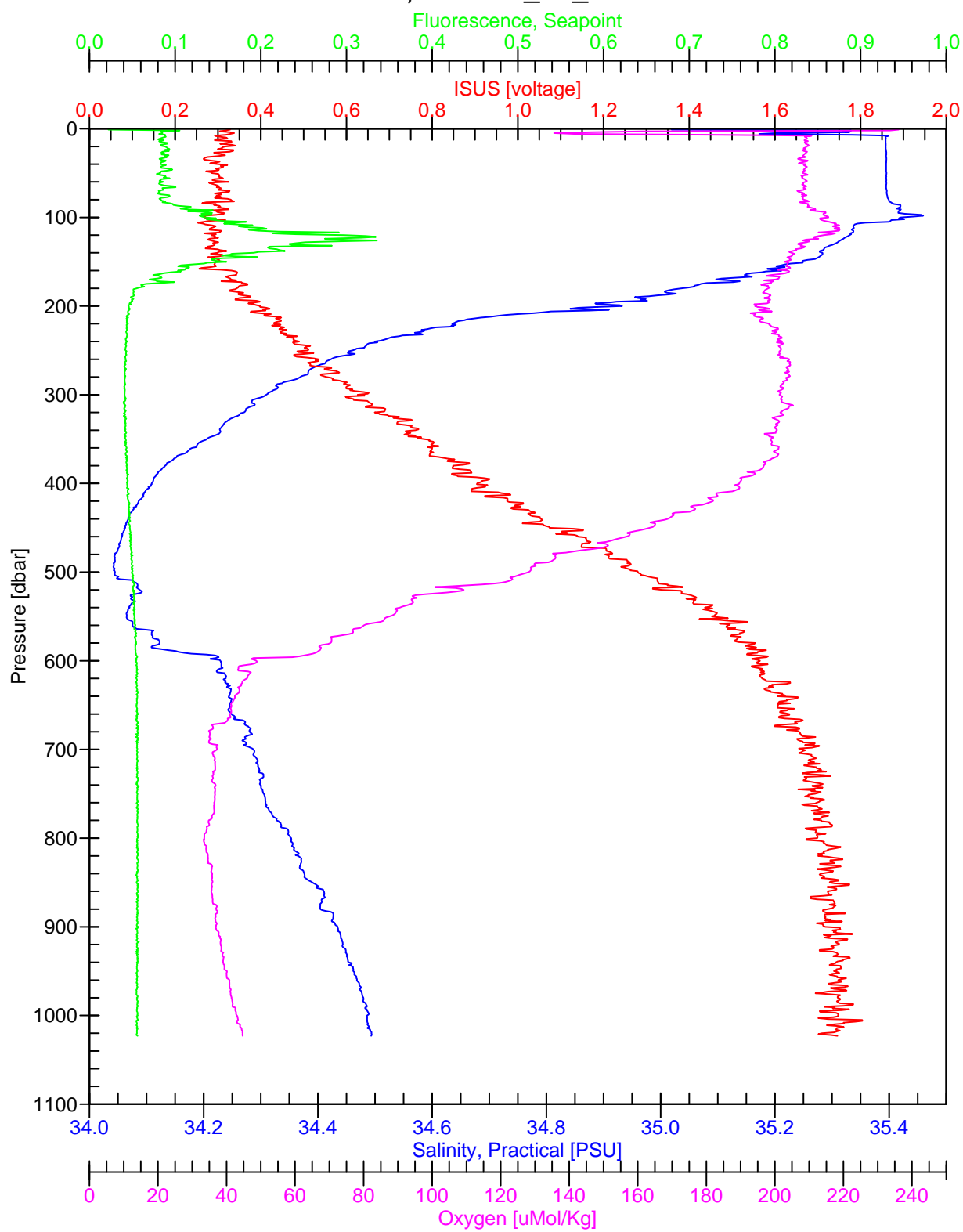
# G-1000, hot-258\_s2\_c9.cnv



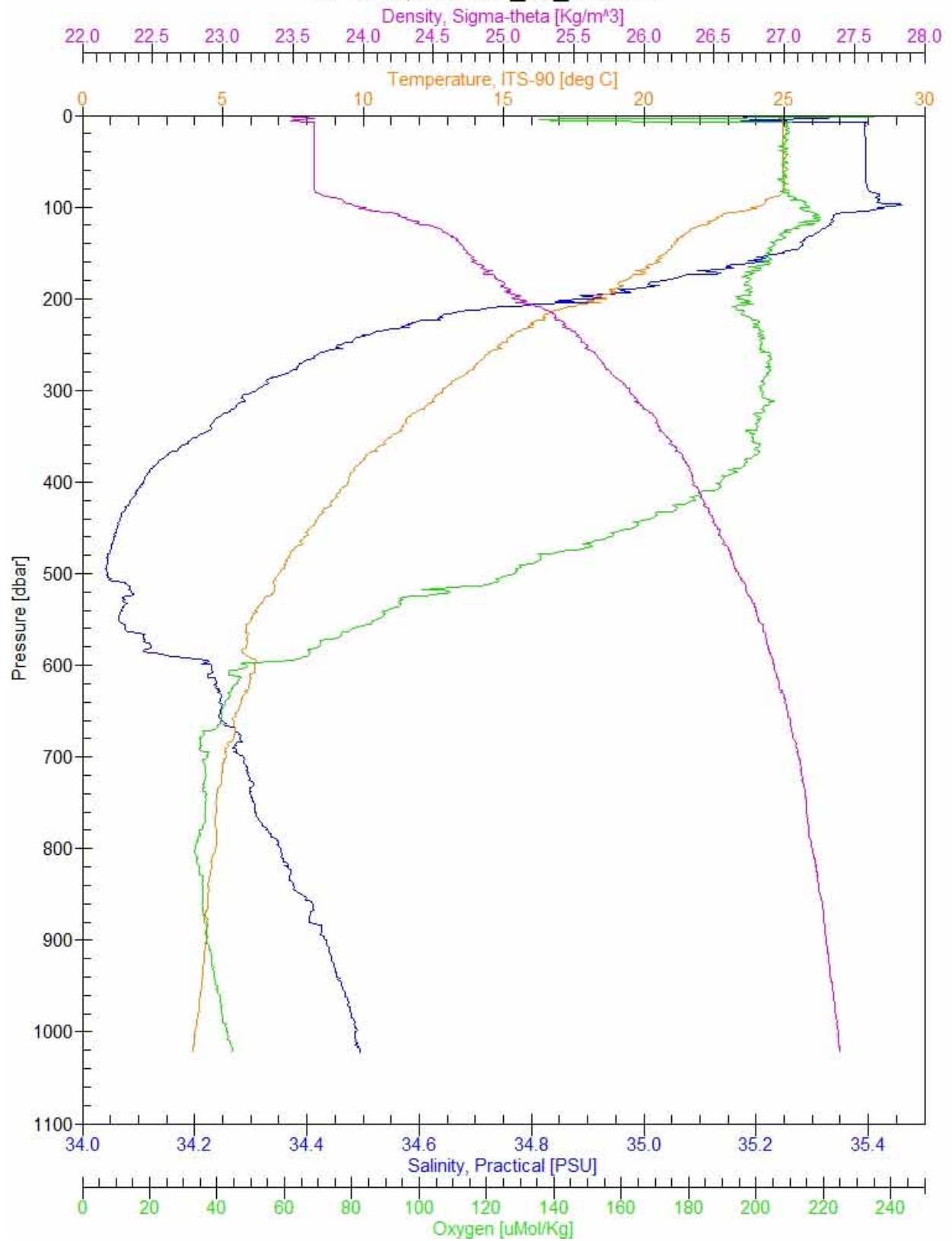
# W-1000, hot-258\_s2\_c9.cnv



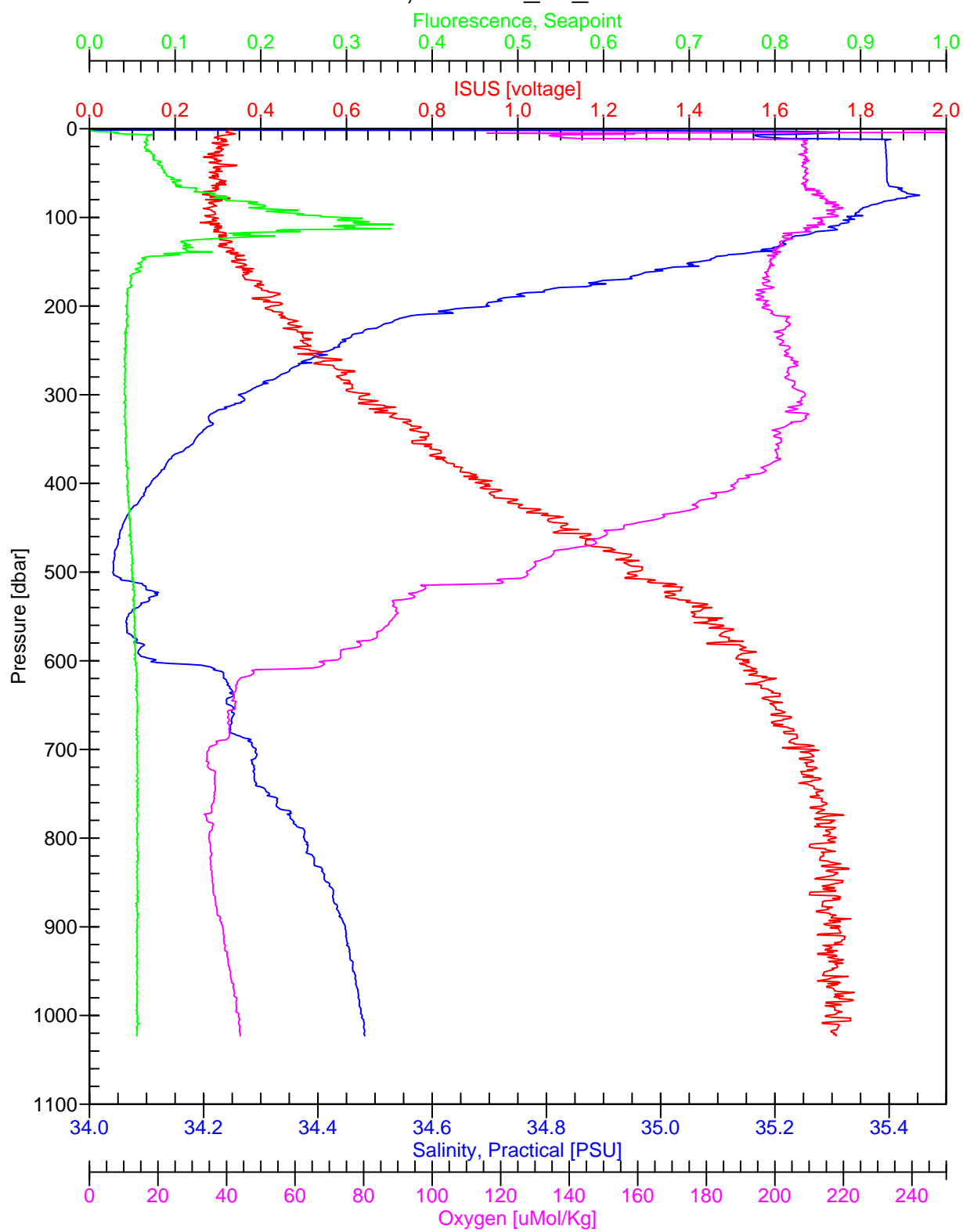
# G-1000, hot-258\_s2\_c10.cnv



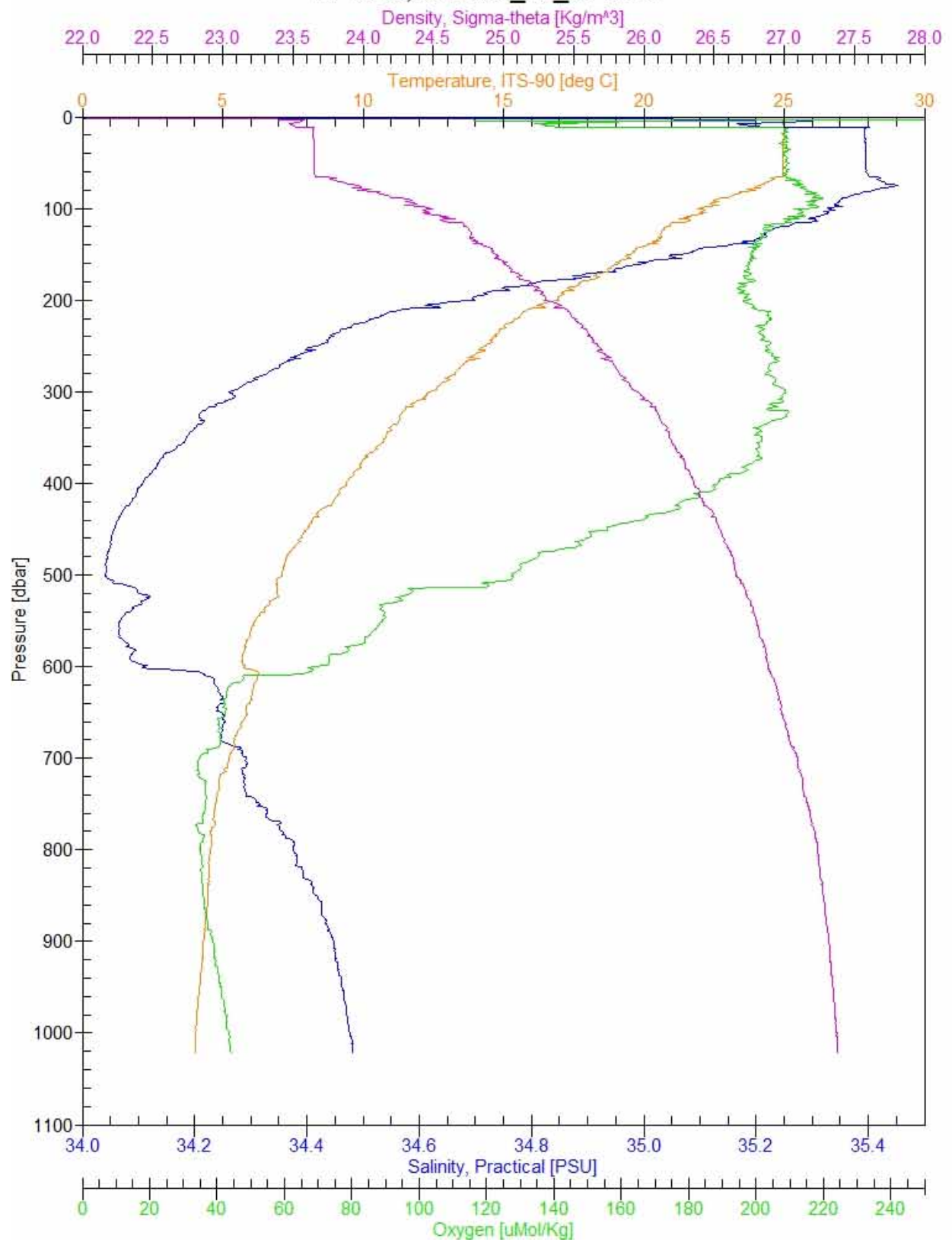
# W-1000, hot-258\_s2\_c10.cnv



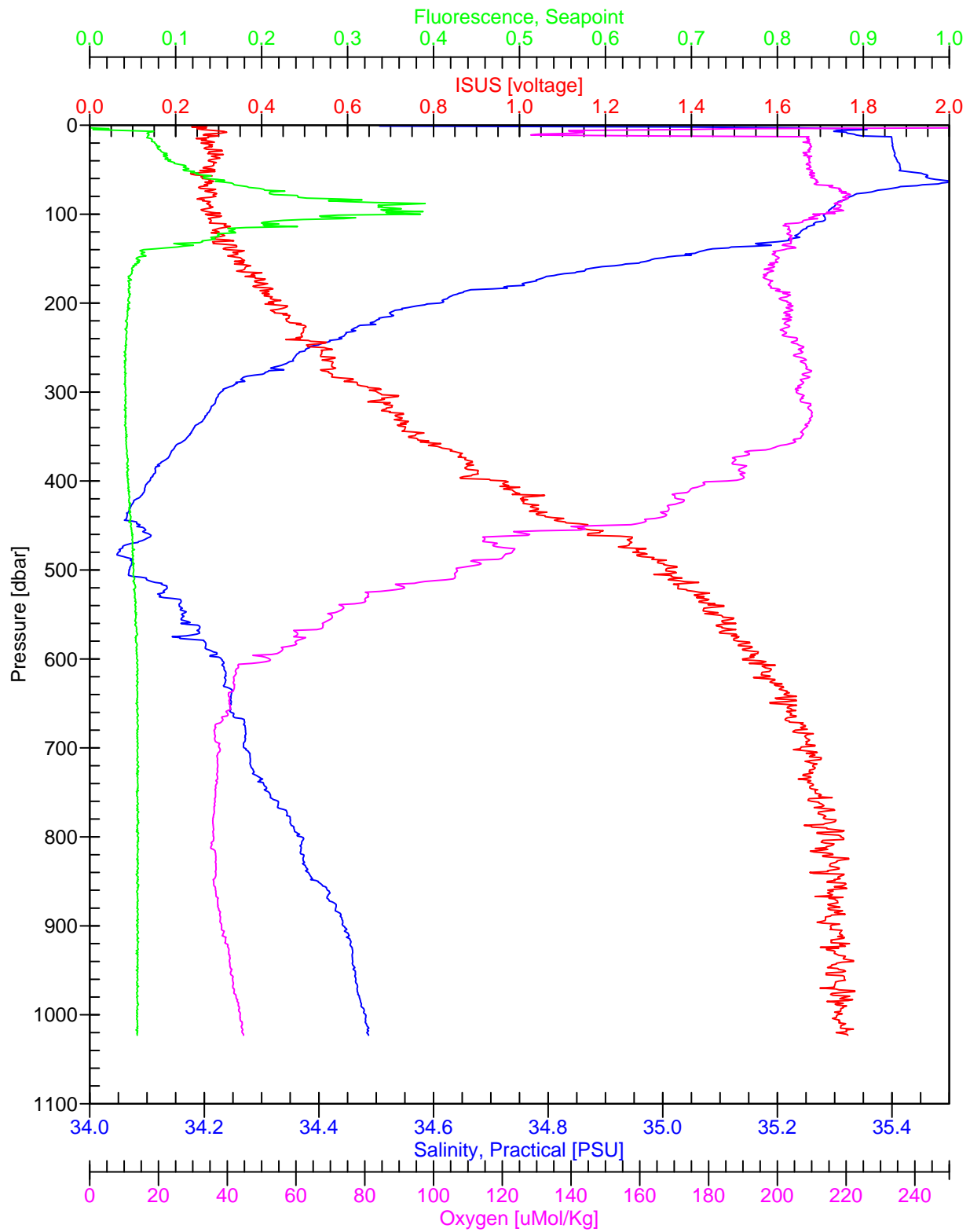
# G-1000, hot-258\_s2\_c11.cnv



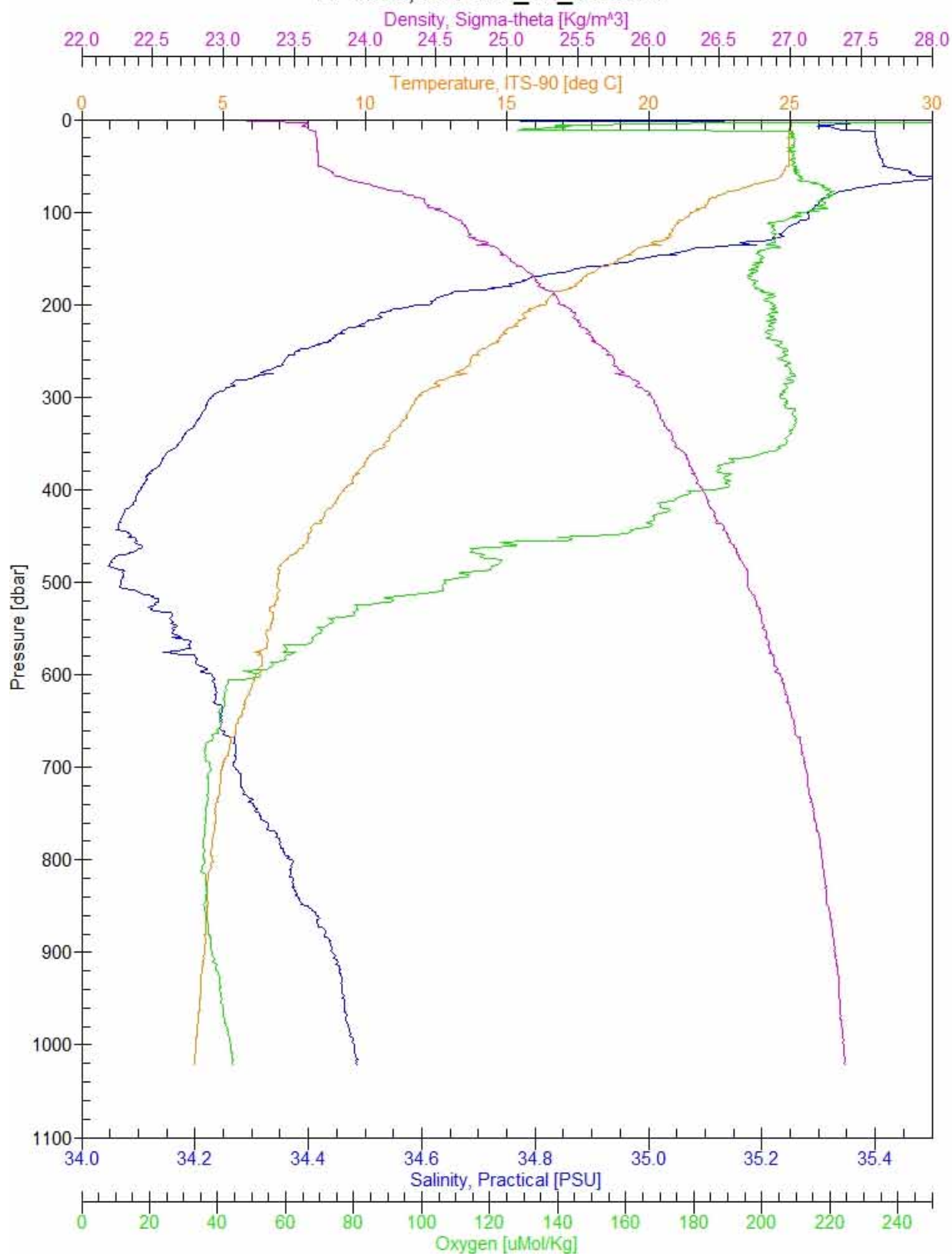
# W-1000, hot-258\_s2\_c11.cnv



# G-1000, hot-258\_s2\_c12.cnv

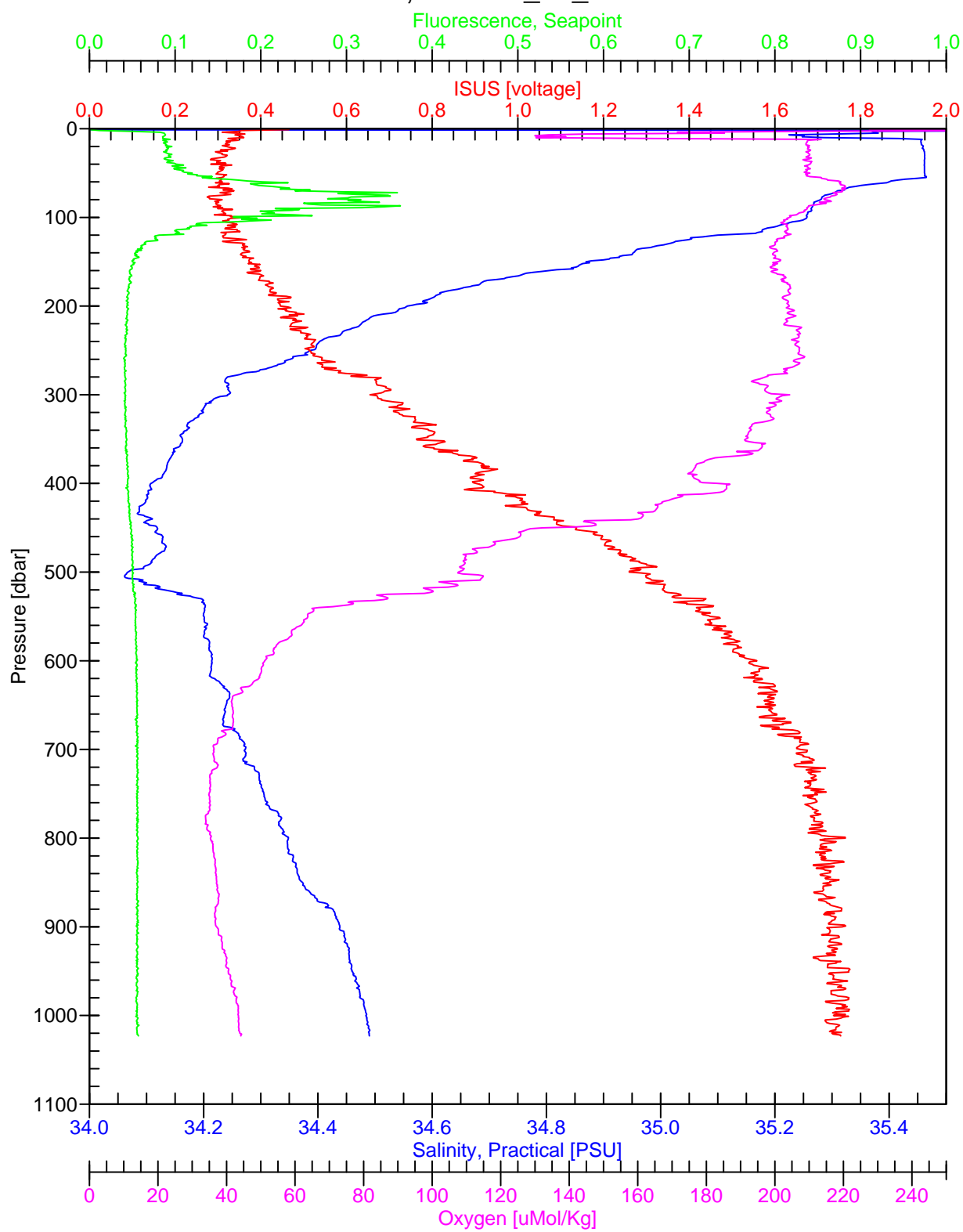


# W-1000, hot-258\_s2\_c12.cnv

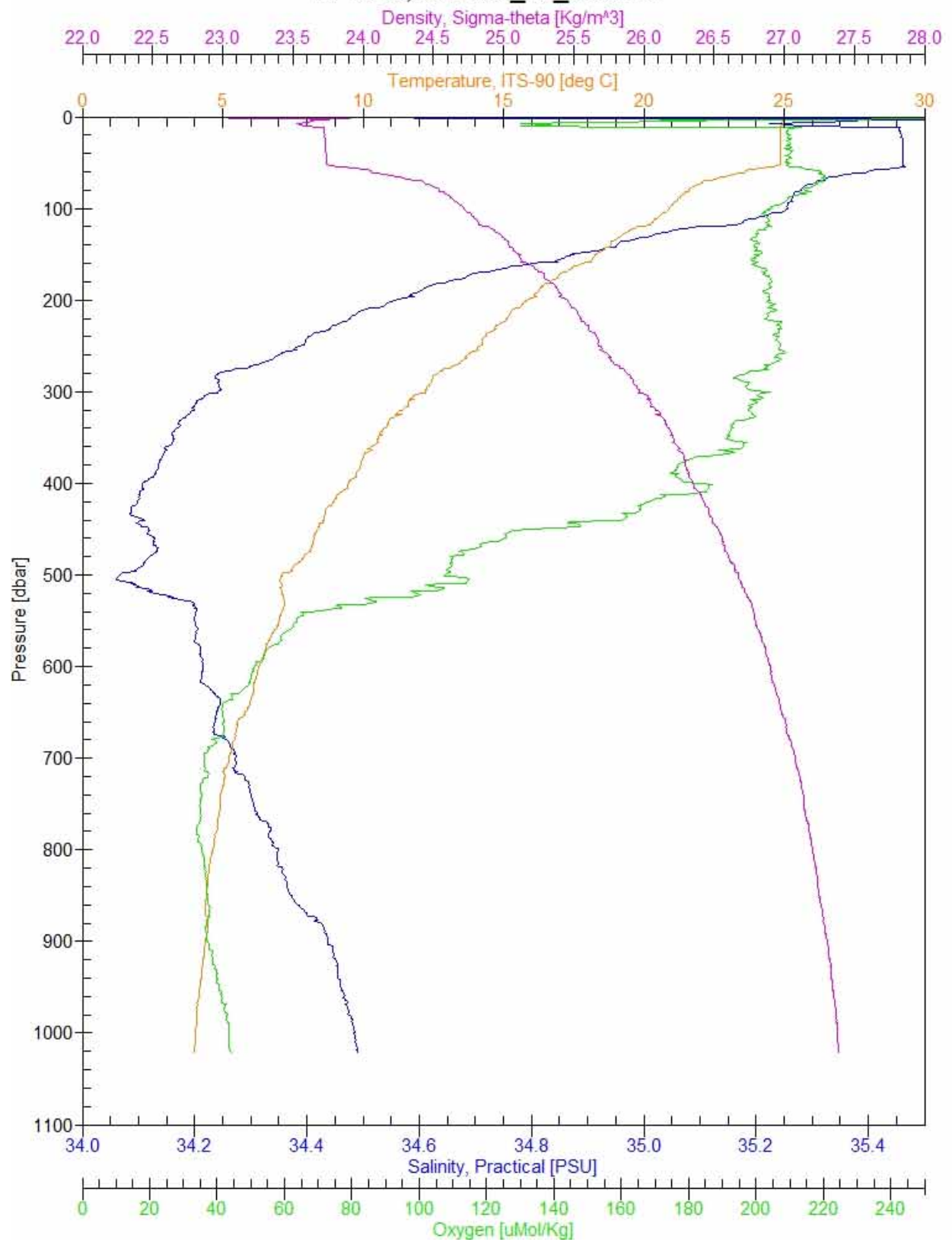




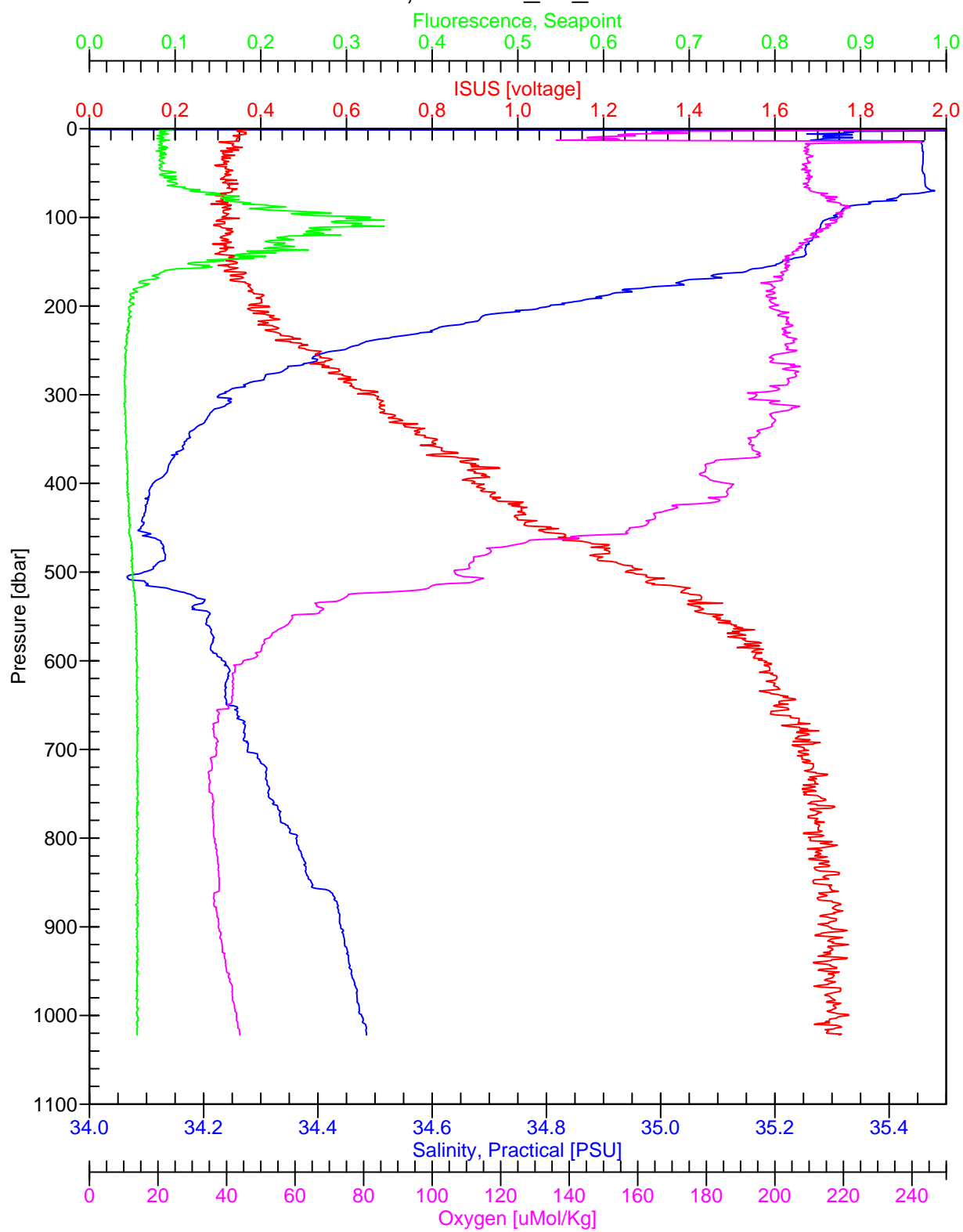
# G-1000, hot-258\_s2\_c13.cnv



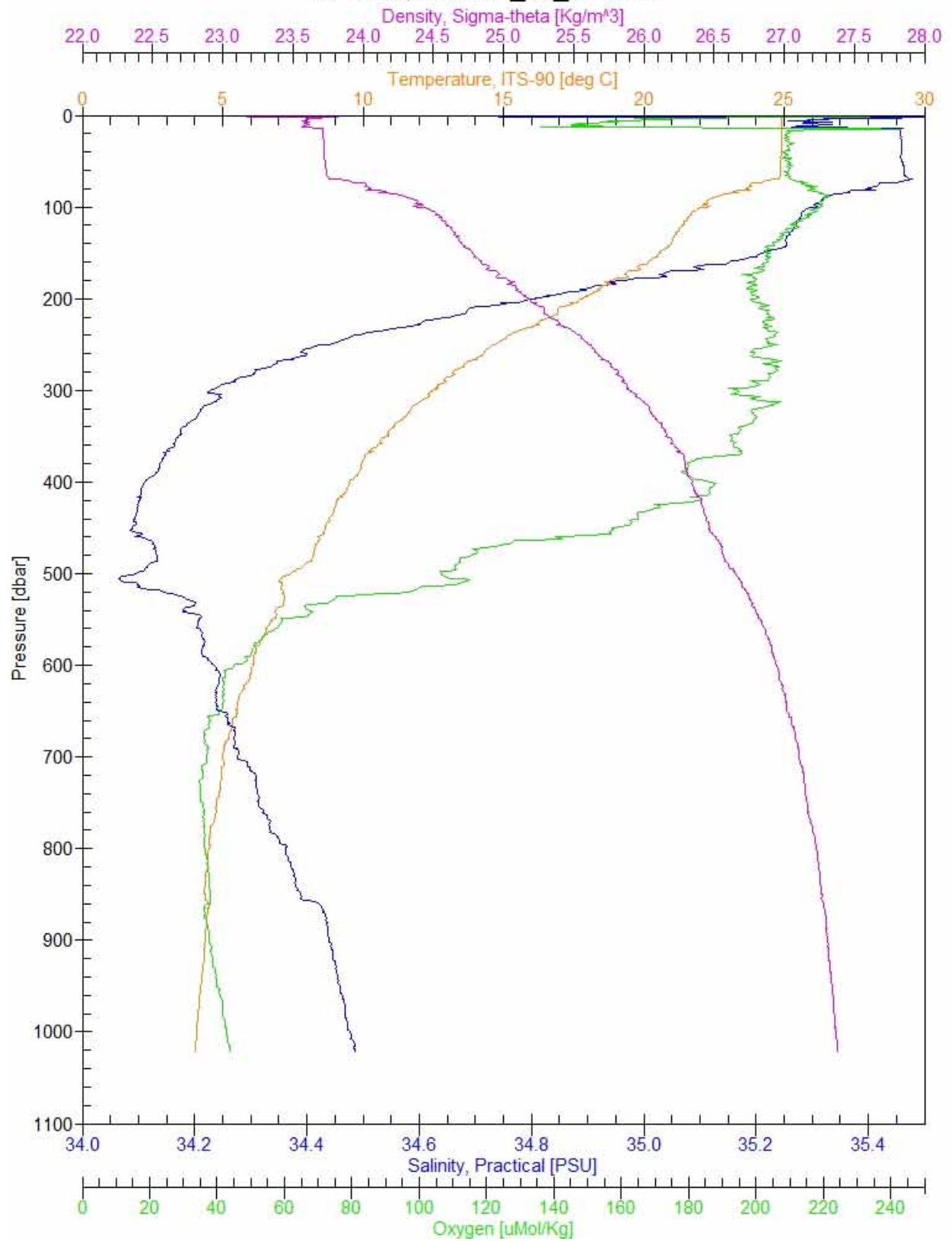
# W-1000, hot-258\_s2\_c13.cnv



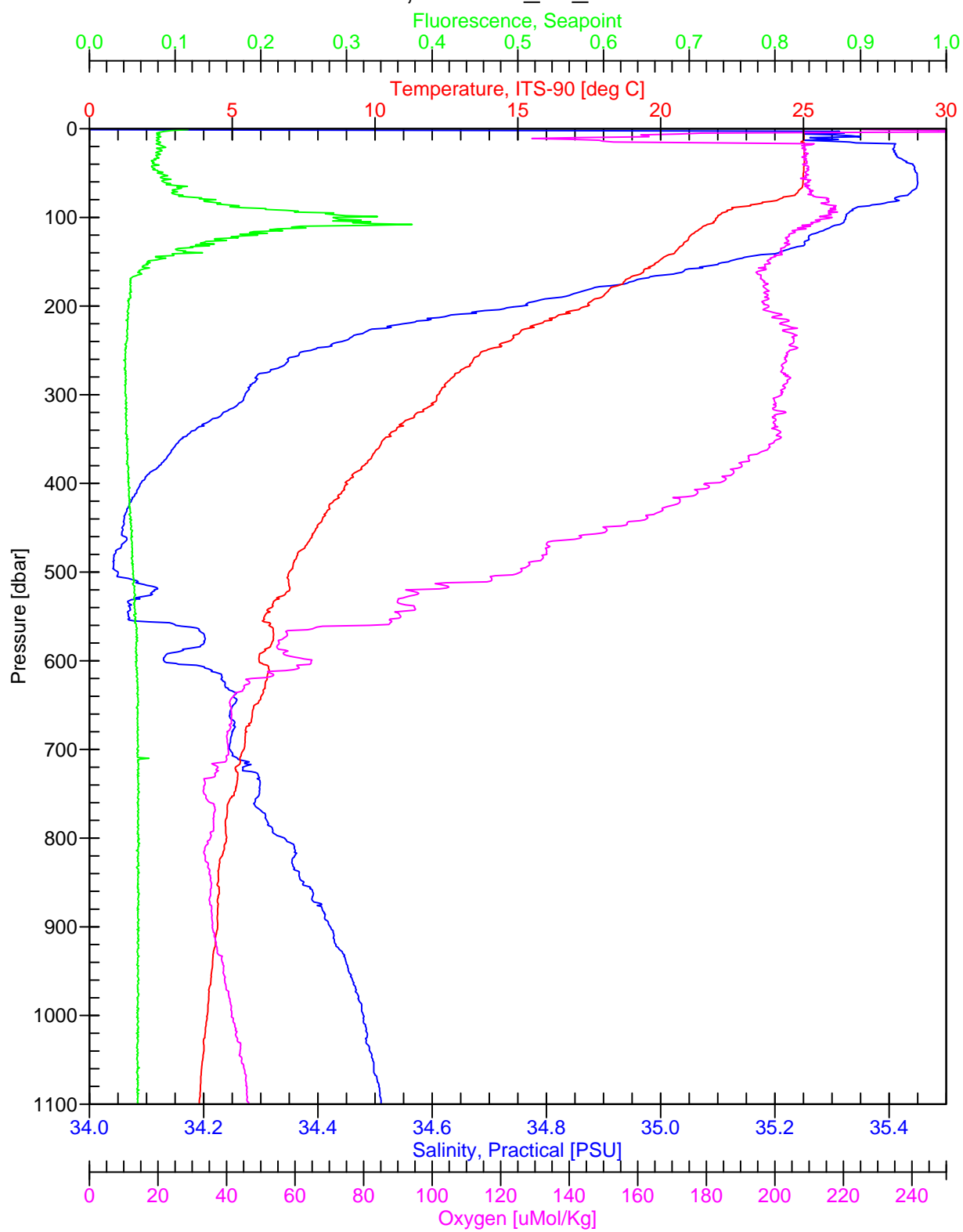
# G-1000, hot-258\_s2\_c14.cnv



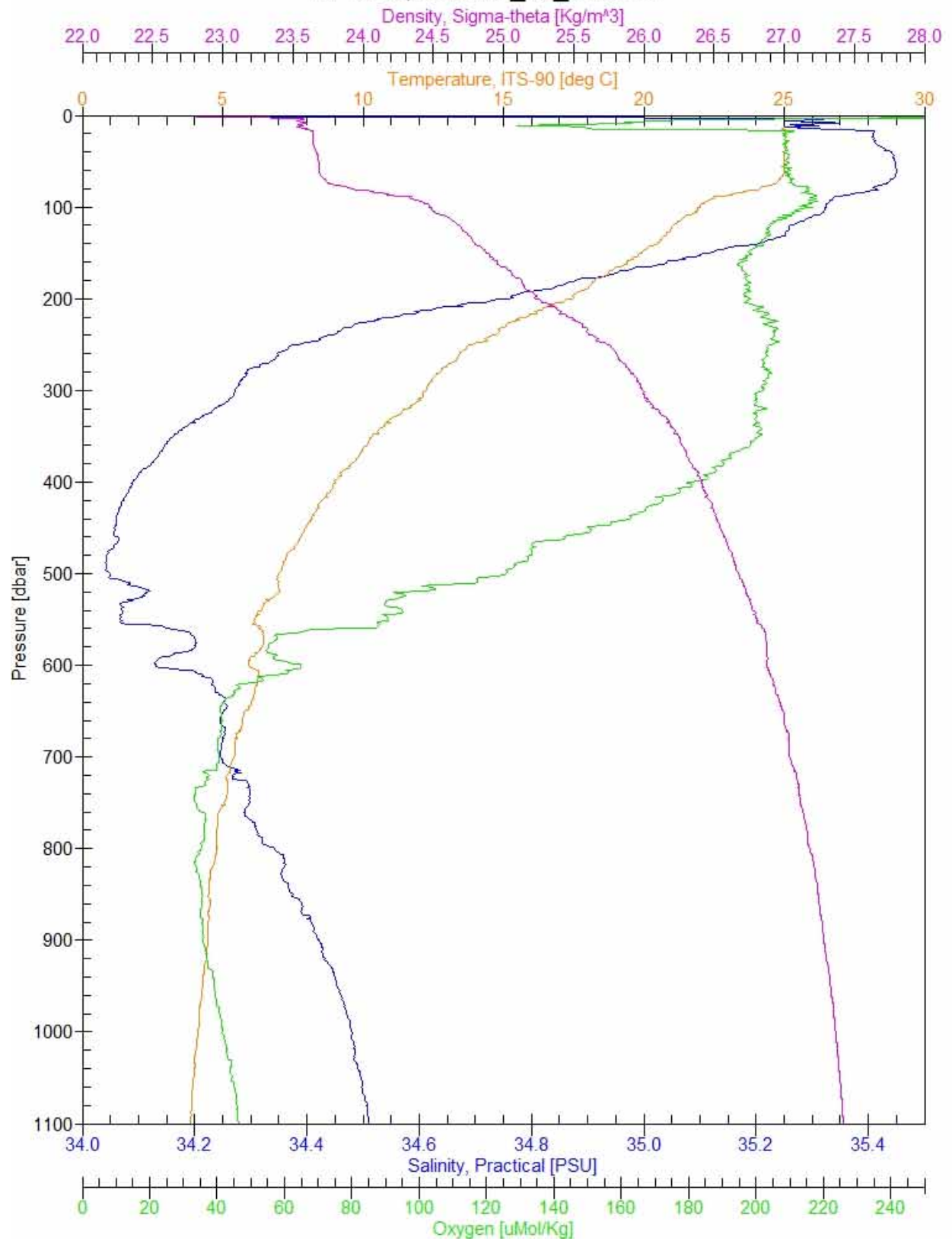
# W-1000, hot-258\_s2\_c14.cnv



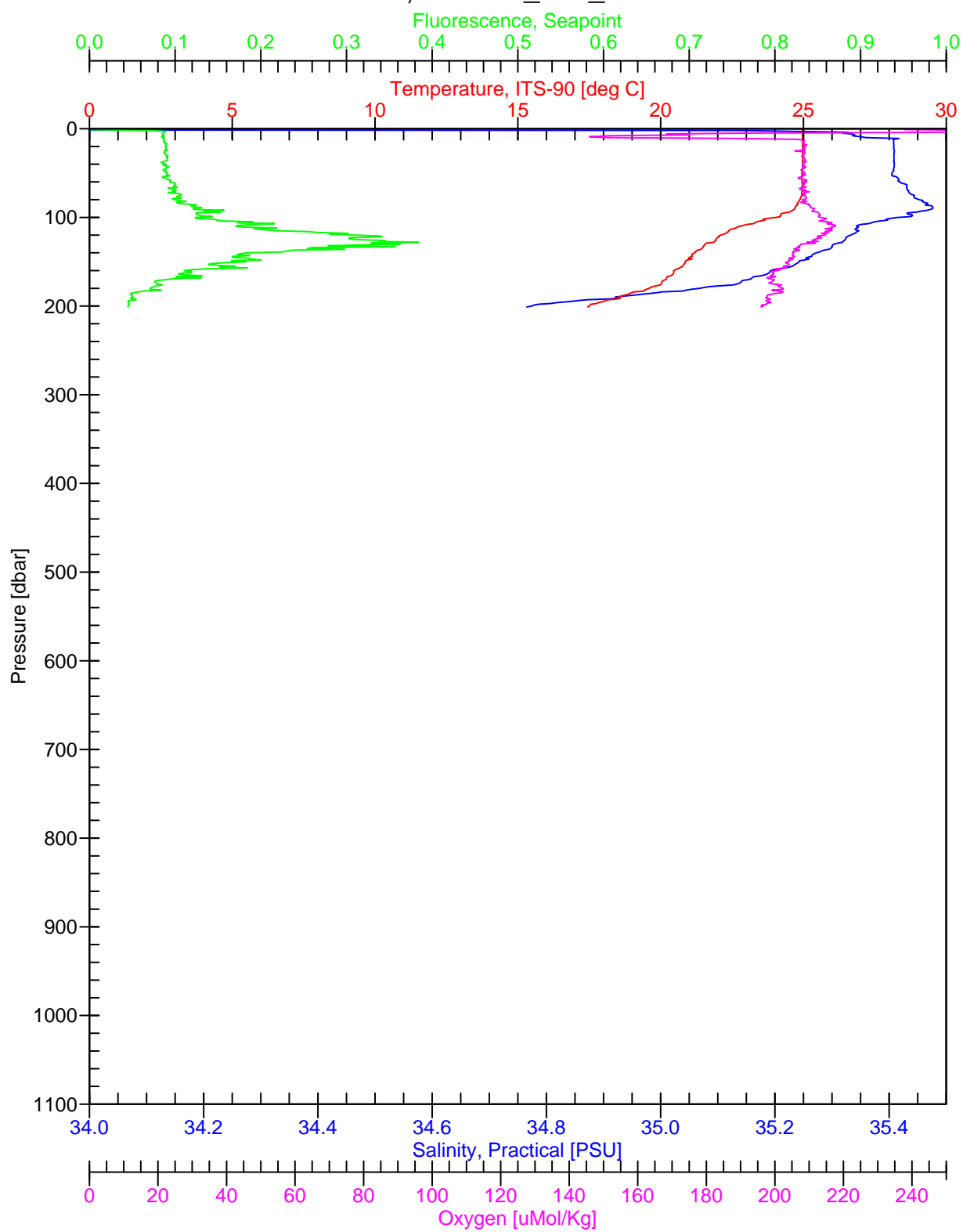
# G-1000, hot-258\_s2\_c15.cnv



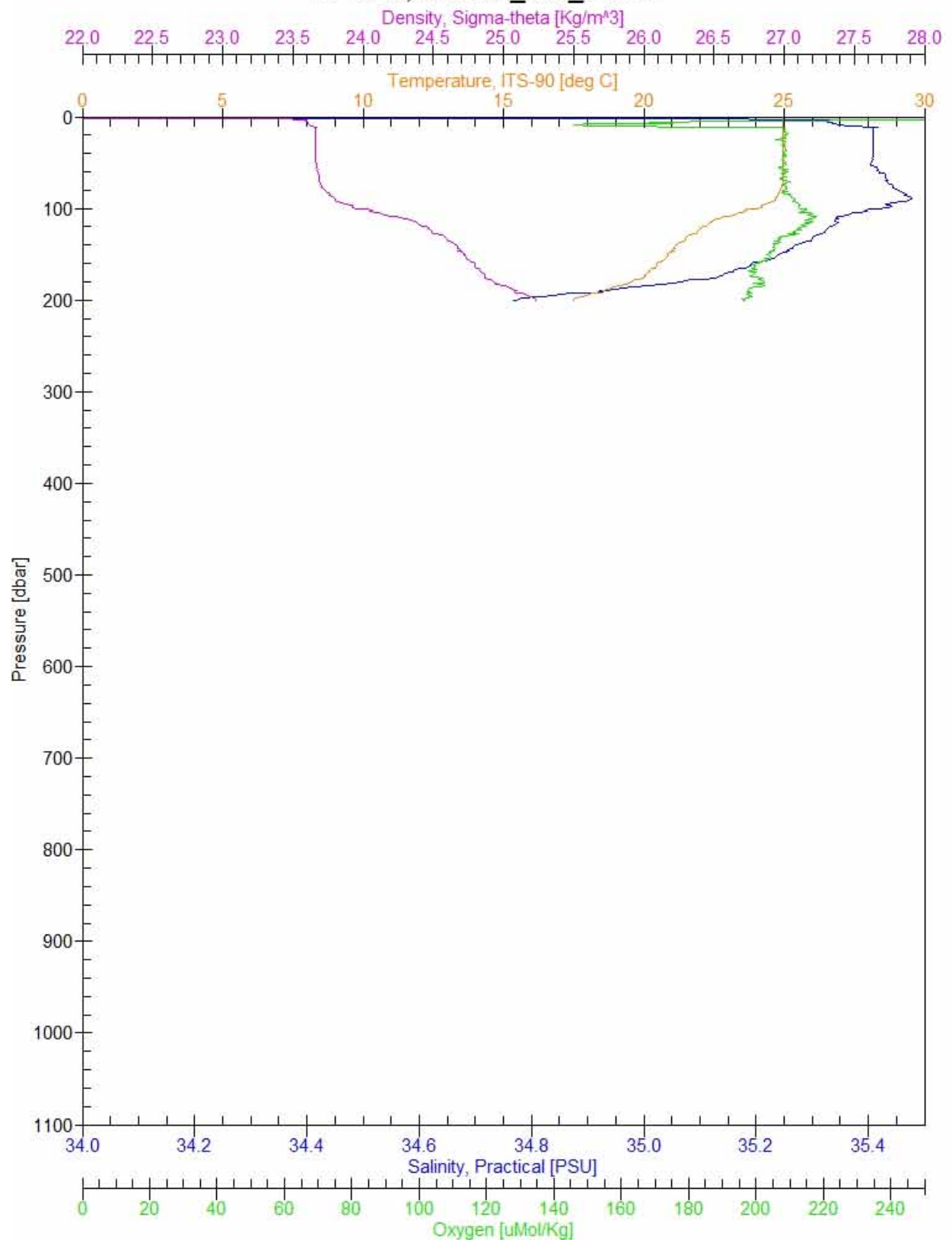
# W-1000, hot-258\_s2\_c15.cnv



# G-1000, hot-258\_s52\_c1.cnv

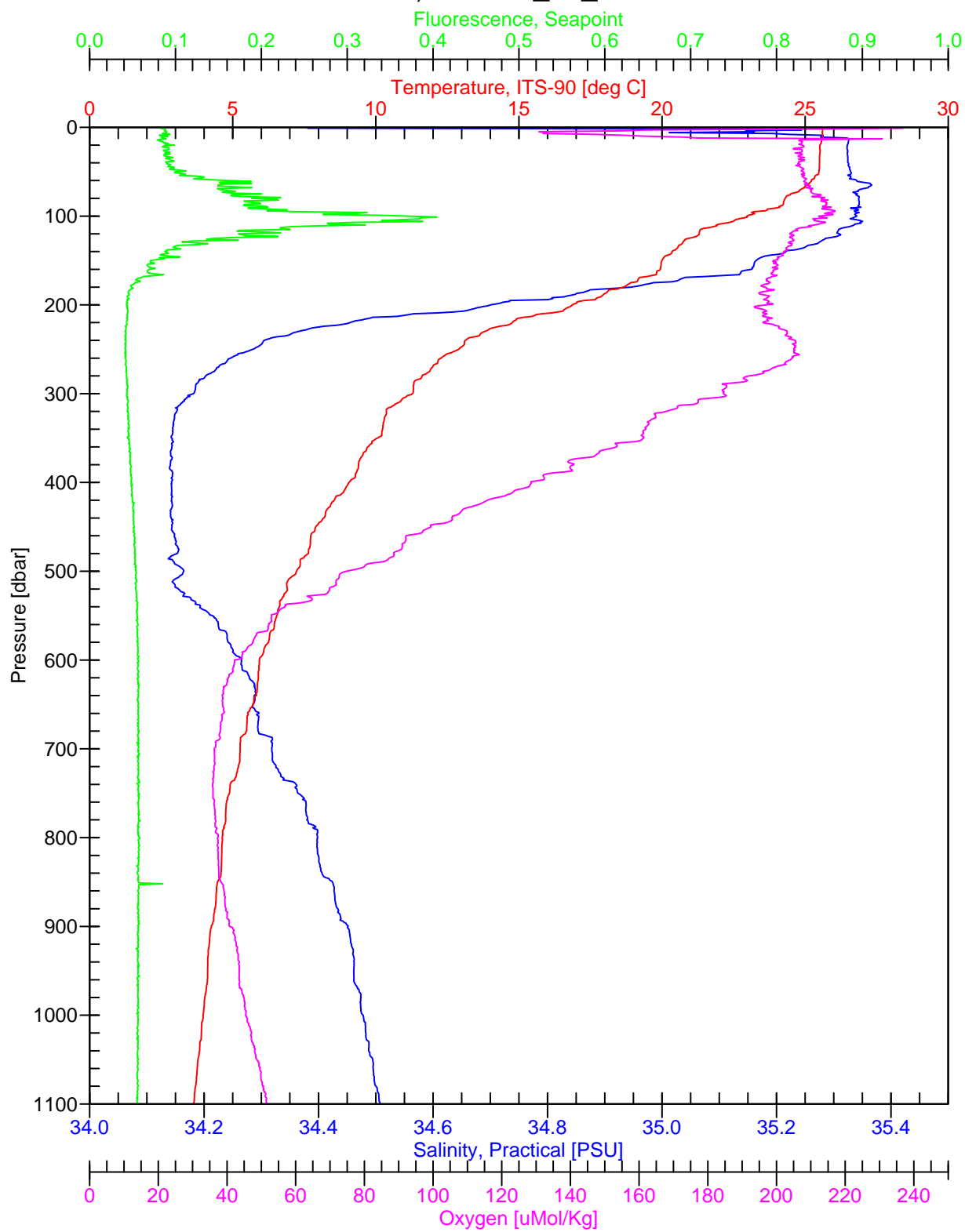


# W-1000, hot-258\_s52\_c1.cnv

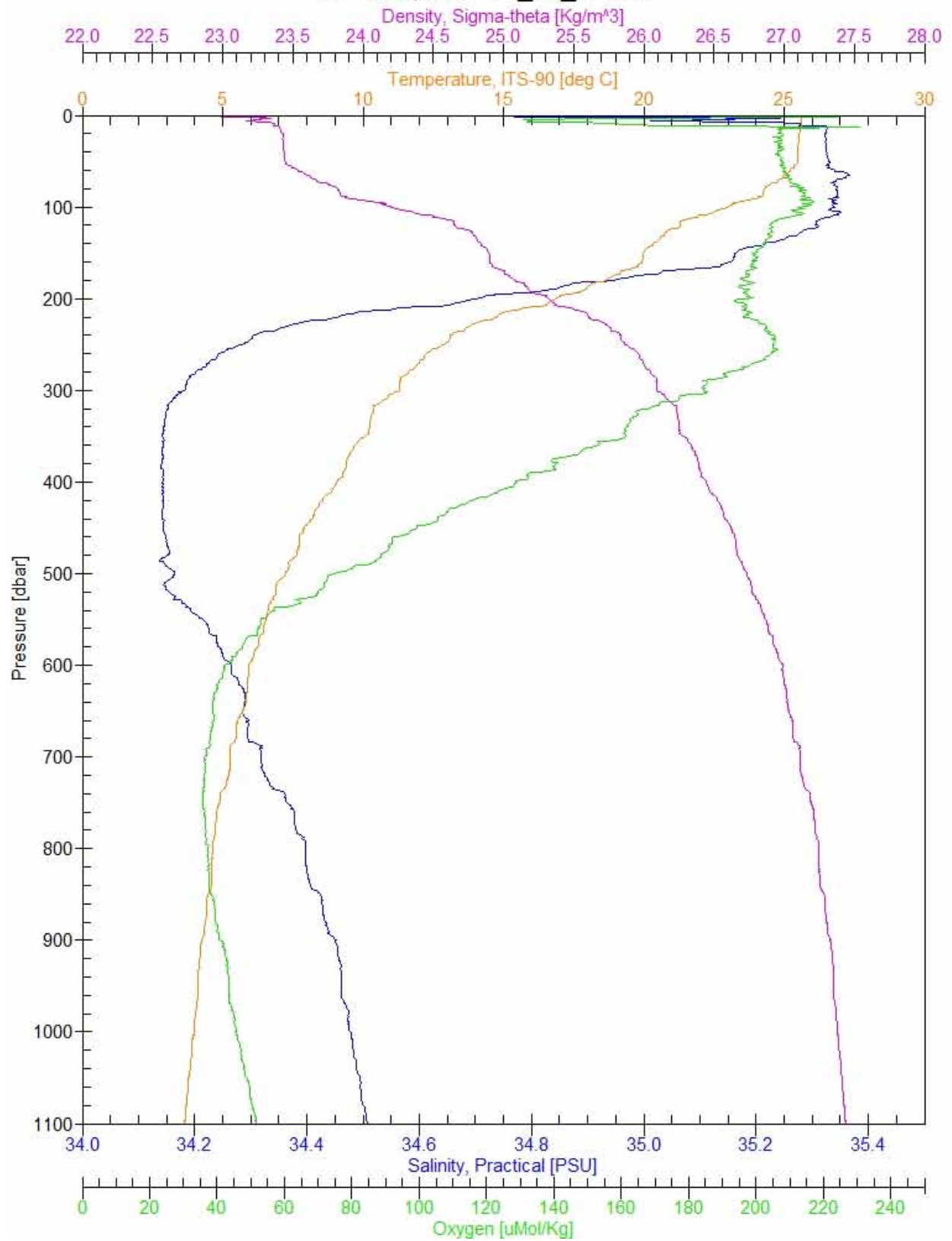




# G-1000, hot-258\_s6\_c1.cnv



# W-1000, hot-258\_s6\_c1.cnv



## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
61000 GPs	12L	26.11	DM

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer - OTG/B. Barone  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS  
☐ PO Fluorometer  
☐ Sal min: 400 dbar  
 mixed layer: 55 dbar

Station: 1	Cast: 1
Latitude start: 21 20.627	Longitude start: 158 16.400
end: 21 20.620	end: 158 16.430
Depth of water: 1574 meters	Date (GMT): 12 / 19 / 13
Pressure on Deck	Time:
Begin: -0.42	Start Log: 22 54
End: -0.42	In Water: 22 59
Max cast pressure: 1020 dbar	Out of Water: 12/20/13
	0011

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	23:30:40	23:31:10	1019	1020	
2	34:10	34:30	900	[900]	
3		40	901	[900]	
4	38:00	38:20	750	750	
5	40:00	40:20	700	700	
6	42:40	43:00	599	600	
7	45:20	45:40	499	500	
8	48:00	48:20	400	400	
9	49:50	50:10	349	350	
10	51:30	51:50	300	300	
11	53:20	53:40	249	250	
12	54:40	55:00	224	225	
13	56:20	56:40	199	200	
14	57:20	57:40	175	175	
15	58:50	59:10	150	150	
16	00:00:10	00:00:30	124	125	
17	01:20	01:40	115	115	
18	02:20	02:40	100	100	
19	03:30	03:50	74	75	
20	04:40	05:00	61	60	
21	06:00	06:20	45	45	
22	07:20	07:40	25	25	
23	09:30	09:50	6	[5]	
24		10:00	6	[5]	

Hawaii Ocean Time Series			Station #: 1	Cast #: 1	Box #: 2
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS/DR	
Niskin #	Depth	Serial #	Comments		
1	1020	25			
2	900	26			
3	900	27			
4	750	28			
5	700	29			
6	600	30			
7	500	31			
8	400	32			
9	350	33			
10	300	34			
11	250	35			
12	225	36			
13	200	37			
14	175	38			
15	150	39			
16	125	40			
17	115	41			
18	100	42			
19	75	43			
20	60	44			
21	45	45			
22	25	46			
23	5	47			
24	5	48			

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000 GPS	12L	24.89	CF/DM

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer  
☐

mixed to: 50  
 sal min: 500

Station: 2	Cast: 1
Latitude start: 22 45.019 end: 22 45.011	Longitude start: 158 2.066 end: 158 2.077
Depth of water: 4751 meters	Date (GMT): 12 / 20 / 13
Pressure on Deck	Time:
Begin: -0.47 End: -0.43	Start Log: 11:50 In Water: 12:01 Out of Water: 13:11
Max cast pressure: 1024 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	12:34:10	12:34:40	1021	1020	
2	45:40	46:10	500	500	sal min
3	53:20	53:50	173	175	
4	55:30	56:00	149	150	
5	57:40	58:10	125	125	
6		20	126	125	
7		30	126	125	
8	59:50	13:00:30	100	100	
9		30	101	100	
10		40	100	100	
11	13:02:10	13:02:40	73	75	
12		50	72	75	
13		03:00	73	75	
14	05:00	05:30	44	45	
15		40	44	45	
16		50	45	45	
17	07:10	07:40	27	25	
18		50	25	25	
19		08:00	22	25	
20	09:40	10:10	7	5	
21		20	7	5	
22		30	7	5	
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 1	Box #: 3
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler: DM/JS	
Niskin #	Depth	Serial #	Comments		
1	1020	49			
2	500	50			
3	175	51			
4	150	52			
5	125	53			
6	125	54			
7	125	55			
8	100	56			
9	100	57			
10	100	58			
11	75	59			
12	75	60			
13	75	61			
14	45	62			
15	45	63			
16	45	64			
17	25	65			
18	25	66			
19	25	67			
20	5	68			
21	5	69			
22	5	70			
23					
24					

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G5000GPS	12L	24.88	DM

Station: 2	Cast: 2
Latitude start: 22 45.009	Longitude start: 157 59.971
end: 22 45.003	end: 158 0.000
Depth of water: 4742 meters	Date (GMT): 12 / 20 / 2013
Pressure on Deck	Time:
Begin: -0.44	Start Log: 1501
End: -0.46	In Water: 1504
Max cast pressure: 4806 dbar	Out of Water: 1855

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS - Removed  
☐ PO Fluorometer  
☐ sal min: 500

dbar	altimeter
4750	60
4790	23
4800	15
4805	

mixed: 75

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1		16:58:10	4805	4800	① 4500 - 4700 - 4750
<del>2</del>	17:05:40	17:06:10	4597	4600	
3	09:10	09:40	4501	4500	
4	11:50	12:20	4401	4400	10m off @ 22°45.053 157°59.979
5	16:15	16:45	4197	4200	
6	21:40	22:10	3998	4000	
7	27:00	27:30	3800	3800	
8	31:45	32:15	3601	3600	
9	36:10	36:40	3401	3400	
10	40:40	41:10	3196	3200	
11	45:20	45:50	3000	3000	
12	49:50	50:20	2798	2800	
13	54:20	54:50	2599	2600	
14	59:00	59:30	2403	2400	
15	18:03:50	18:04:20	2200	2200	
16	08:20	08:50	1998	2000	
17	12:40	13:10	1798	1800	
18	17:10	17:40	1600	1600	
19	21:40	22:10	1403	1400	
20	26:20	26:50	1199	1200	
21	30:50	31:20	1000	1000	
22	36:00	36:30	750	750	
23	41:15	41:45	498	500	
24	53:00	53:30	7	5	



Hawaii Ocean Time Series			Station #: 2	Cast #: 2	Box #: 4
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler: DM / JS	
Niskin #	Depth	Serial #	Comments		
1	4800	73			
2	4600	74			
3	4500	75			
4	4400	76			
5	4200	77			
6	4000	78			
7	3800	79			
8	3600	80			
9	3400	81			
10	3200	82			
11	3000	83			
12	2800	84			
13	2600	85			
14	2400	86			
15	2200	87			
16	2000	88			
17	1800	89			
18	1600	90			
19	1400	91			
20	1200	92			
21	1000	93			
22	750	94			
23	500	95			
24	5	96			



# — Duplicates —

Hawaii Ocean Time Series			Station #: 2	Cast #: 2	Box #: 5
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: JS/DM	
Niskin #	Depth	Serial #	Comments		
1	4800	97			
2	4600	98			
3	4500	99			
4	4400	100			
5	4200	101			
6	4000	102			
7	3800	103			
8	3600	104			
9	3400	105			
10	3200	106			
11	3000	107			
12	2800	108			
13	2600	109			
14	2400	110			
15	2200	111			
16	2000	112			
17	1800	113			
18	1600	114			
19	1400	115			
20	1200	116			
21	1000	117			
22	750	118			
23	500	119			
24	5	120			

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000 GPs	12L	25.05	DM

- ☐ Pinger  
☐ Altimeter  
☒ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☒ ISUS - Re-installed  
☐ PO Fluorometer  
☐ S-min: 500  
           Mixed: 50

Station: 2	Cast: 3
Latitude start: 22 44.989 end: 22 45.018	Longitude start: 158 0.015 end: 157 59.989
Depth of water: 4742 meters	Date (GMT): 12 / 20 / 13
Pressure on Deck	Time:
Begin: -0.45 End: -0.46	Start Log: 2112 In Water: 2114 Out of Water:
Max cast pressure: 1020 dbar	2240

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	21:46:20	21:46:50	1020	1020	
2	:49:00	:49:30	973	976	
3	:51:30	:52:00	932	933	
4	:54:00	:54:30	889	889	
5	:56:45	:57:15	846	845	
6	59:00	59:30	799	800	
7	22:01:10	22:01:40	755	755	
8	03:20	03:50	718	720	
9	05:20	05:50	684	685	
10	07:30	08:00	631	630	
11	09:20	09:50	591	590	
12	11:30	12:00	546	545	
13	13:20	13:50	520	520	
14	14:50	15:20	499	500	
15	16:40	17:10	460	460	
16	18:30	19:00	420	420	
17	20:40	21:10	357	355	
18	22:30	23:00	316	315	
19	24:40	25:10	260	263	
20	27:00	27:30	210	210	
21	29:20	29:50	154	155	
22	31:00	31:30	121	120	
23	32:50	33:30	87	85	
24	34:30	35:00	68	70	

Station: <u>2</u>	Cast: <u>3</u>
Latitude: <u>22°44.989</u>	Longitude: <u>158°0.015</u>
Date: <u>12/20/13</u>	Time (GMT): <u>21:12 →</u>
Operator: <u>DM</u>	

$\delta\theta$	$\sigma\theta$	Depth
700	20.76	
650	21.28	
600	21.80	
550	22.33	
500	22.85	
450	23.37	
400	23.90	<u>70</u>
350	24.42	<u>85</u>
300	24.95	<u>155</u>
250	25.47	<u>210</u>
200	26.00	<u>315</u>
180	26.21	<u>355</u>
160	26.42	<u>420</u>
140	26.63	<u>500</u>
130	26.73	<u>545</u>
120	26.84	<u>590</u>
110	26.94	<u>630</u>
100	27.05	<u>685</u>
90	27.16	<u>755</u>
80	27.26	<u>845</u>
70	27.37	<u>~1020</u>

$S_{max}$	<u>70</u>
$S_{min}$	<u>520</u>
$S_{max}$	
$S_{min}$	

$O_{max}$	<u>~85</u>
$O_{min}$	<u>800</u>
$O_{max}$	
$O_{min}$	
$O_{max}$	

$F_{max}$	
$F_{min}$	
$F_{max}$	
$F_{min}$	
$F_{max}$	

Bottle	Depth
1	<u>1020</u>
2	<u>976</u>
3	<u>933</u>
4	<u>889</u>
5	<u>845</u>
6	<u>800</u>
7	<u>755</u>
8	<u>720</u>
9	<u>685</u>
10	<u>630</u>
11	<u>590</u>
12	<u>545</u>
13	<u>520</u>
14	<u>500</u>
15	<u>460</u>
16	<u>420</u>
17	<u>355</u>
18	<u>315</u>
19	<u>263</u>
20	<u>210</u>
21	<u>155</u>
22	<u>120</u>
23	<u>85</u>
24	<u>70</u>

Hawaii Ocean Time Series			Station #: 2	Cast #: 3	Box #: 6
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS/DR	
Niskin #	Depth	Serial #	Comments		
1	1020	121			
2	976	122			
3	933	123			
4	889	124			
5	845	125			
6	800	126			
7	755	127			
8	720	128			
9	685	129			
10	630	130			
11	590	131			
12	545	132			
13	520	133			
14	500	134			
15	460	135			
16	420	136			
17	355	137			
18	315	138			
19	263	139			
20	210	140			
21	155	141			
22	120	142			
23	85	143			
24	70	144			

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G10006PS	12L	25.00	CF

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☒ BEACH Sea Tech Fluorometer  
☒ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer  
☒ Sal min: 500  
                   mixed layer: 65

Station: 2	Cast: 4
Latitude start: 22 44.948 end: 22 45.024	Longitude start: 157 59.336 end: 157 59.360
Depth of water: 4742 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.50 End: -0.48	Start Log: 00:55 In Water: 00:59
Max cast pressure: 1020 dbar	Out of Water: 02:07

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	01:31:45	01:32:15	1018	1020	
2		1:43:40	500	500	5-min
3		47:50	350	[350]	
4		48:00	351	[350]	
5		51:00	249	250	
6		53:06	202	200	
7		54:25	175	175	
8		55:40	150	150	
9		57:05	126	125	
10		58:35	103	100	
11		02:00:25	73	75	
12		02:35	47	45	
13		04:20	25	25	
14		06:20	7	5	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 4	Box #: 7
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: CF/JG/DR	
Niskin #	Depth	Serial #	Comments		
1	1020	145			
2	500	146	S-run		
3	350	147			
4	350	148			
5	250	149			
6	200	150			
7	175	151			
8	150	152			
9	125	153			
10	100	154			
11	75	155			
12	45	156			
13	25	157			
14	5	158			
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
C1000GPS	12L	25.18	JG / CF

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☒ BEACH Sea Tech Fluorometer  
☒ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer  
☐ Mixed layer: 70  
                     5-min: 500

Station: 2	Cast: 5
Latitude start: 22 44.33 end: 22 44.357	Longitude start: 158 1.977 end: 158 1.973
Depth of water: 4752 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.47 End: -0.43	Start Log: 02:50 In Water: 02:57
Max cast pressure: 1021 dbar	Out of Water: 04:03

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	03:21:15	03:27:45	1021	1020	
2		38:20	500	500	Sal m/n
3		43:55	350	350	
4		44:05	351	350	
5		47:10	252	250	
6		49:35	200	200	
7		51:10	175	175	
8		52:45	150	150	
9		54:10	123	125	
10		55:40	99	100	
11		57:10	75	75	
12		58:40	45	45	
13		01:00:00	24	25	
14		01:50	6	5	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					



Hawaii Ocean Time Series			Station #: 2	Cast #: 5	Box #: 7/8
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler: JG/DR/CP	
Niskin #	Depth	Serial #	Comments		
1	1020	159			
2	500	160			
3	350	161			
4	350	162			
5	250	163			
6	200	164			
7	175	165			
8	150	166			
9	125	167			
10	100	168			
11	75	169			
12	45	170			
13	25	171			
14	5	172			
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					



## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000	12L	25.05	CF/JE

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☒ BEACH Sea Tech Fluorometer  
☒ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer

☐ Mixed Layer: 85  
 S-min: 490

Station: 2	Cast: 6
Latitude start: 22 41.675 end: 22 41.775	Longitude start: 158 4.790 end: 158 4.560
Depth of water: 4769 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck Begin: -0.44 End: -0.46	Time: Start Log: 06:00 In Water: 06:06 Out of Water: 07:19
Max cast pressure: 1021 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	06:36:00	06:36:30	1019	1020	
2		42:30	788	790	O <sub>2</sub> min
3		49:20	490	490	Sal min
4		57:20	200	200	
5		59:15	175	175	
6		07:00:15	162	165	
7		01:25	149	150	
8		02:45	128	130	
9		03:40	124	125	
10		04:35	114	115	
11		05:35	108	110	
12		06:45	99	100	
13		07:45	90	90	
14		08:40	86	85	
15		09:40	76	75	
16		10:50	61	60	
17		12:05	44	45	
18		13:00	34	35	
19		14:00	23	25	}
20		:10	23	25	
21		20	23	25	
22		16:10	16	15	
23		18:00	5	5	}
24		:10	5	5	

Hawaii Ocean Time Series			Station #: 2	Cast #: 6	Box #: 8/9
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler: SG/CF	
Niskin #	Depth	Serial #	Comments		
1	1020	173			
2	790	174			
3	490	175			
4	200	176			
5	175	177			
6	165	178			
7	150	179			
8	130	180			
9	125	181			
10	115	182			
11	110	183			
12	100	184			
13	90	185			
14	85	186			
15	75	187			
16	60	188			
17	45	189			
18	35	190			
19	25	191			
20	25	192			
21	25	193			
22	15	194			
23	5	195			
24	5	196			

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GAS	12L	25.02	CF

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer  
☐

large sal dills (0.010) in upper 150

Station: 2	Cast: 7
Latitude start: 22 41.676 end: 22 41.631	Longitude start: 158 3.330 end: 158 3.336
Depth of water: 4768 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.48	Start Log: 09:00
End: -0.45	In Water: 09:09
Max cast pressure: 1021 dbar	Out of Water: 10:13

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	09:39:30	09:40:00	1021	1020	
2		52:30	491	490	sal min
3		10:00:00	176	175	
4		02:00	150	150	
5		03:30	124	125	
6		05:00	96	100	
7		07:00	70	75	
8		09:00	45	45	
9		10:40	25	25	
10		1:50	24	25	
11		12:45	6	5	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 7	Box #: 9
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler: CT/JG	
Niskin #	Depth	Serial #	Comments		
1	1020	197			
2	sal. unit	198			
3	175	199			
4	150	200			
5	125	201			
6	100	202			
7	75	203			
8	45	204			
9	25	205			
10					
11	5	206			
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G10006125	12L	25.04	DM/CF

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS  
☐ PO Fluorometer  
☐

mixed to 60 (Temp), 35 (sal)  
 sal min: 490

Station: 2	Cast: 8
Latitude start: 22 42.511	Longitude start: 158 2.546
end: 22 42.543	end: 158 2.537
Depth of water: 4761 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.48	Start Log: 11:56
End: -0.42	In Water: 1203
Max cast pressure: 1021 dbar	Out of Water: 1314

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	12:40:30	12:41:00	1017	1020	
2	53:00	53:30	491	490	sal min
3	13:01:40	13:03:10	125	[125]	
4		:20	123	[125]	
5	03:40	04:10	99	[100]	
6		:20	97	[100]	
7	06:00	06:30	75	[75]	
8		:40	73	[75]	
9	08:40	09:10	44	[45]	
10		:20	43	[45]	
11	10:50	11:20	23	[25]	
12		:30	23	[25]	
13		:40	23	[25]	
14	13:10	13:40	7	[5]	
15		:50	8	[5]	
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 8	Box #: 9/10
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS	
Niskin #	Depth	Serial #	Comments		
1	1020	207			
2	sal mini	208			
3	125	209			
4	125	210			
5	100	211			
6	100	212			
7	75	213			
8	75	214			
9	45	215			
10	45	216			
11	25	217			
12	25	218			
13					
14	5	219			
15	5	220			
16					
17					
18					
19					
20					
21					
22					
23					
24					



## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
61000GPS	12L	25.02	DM

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer

☐ 5-min: 500  
 mixed: 60 dbar (80 for T, O<sub>2</sub>)

Station: 2	Cast: 9
Latitude start: 22 44.891 end: 22 44.931	Longitude start: 158 2.043 end: 158 2.034
Depth of water: 4750 meters	Date (GMT): 12 / 21 / 2013
Pressure on Deck	Time:
Begin: -0.46 End: -0.47	Start Log: 1451 In Water: 1457
Max cast pressure: 1022 dbar	Out of Water: 1618

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
X 1	15:29:50	15:30:20	1022	1020	
X 2	41:30	42:00	501	500	5-min
3	48:50	49:20	200	200	
4	50:50	51:20	174	175	
5	52:30	53:00	159	160	
6	53:40	54:10	154	150	* Big oscillations during bottle fire
7	55:00	55:20	144	145	(~ 7 m)
8	56:10	56:30	142	140	
9	57:20	57:50	132	135	
10	58:20	58:50	130	130	
11	59:30	16:00:00	123	125	
12	16:00:30	01:00	120	120	
13	01:30	02:00	117	115	mrk ~ 121, big oscillations
14	02:40	03:10	110	110	
15	03:40	04:10	105	105	
16	04:40	05:10	97X	100	
17	05:40	06:10	92	95	
18	06:40	07:10	89	90	
19	07:30	08:00	84	85	
20	08:30	09:00	76	75	
21	09:40	10:10	64	65	
22	11:00	11:30	46	45	
23	13:20	13:50	24	25	
X 24	17:40	18:10	6	5	- (TD) came out, resubmerged to 12m and brought back to 5m

Hawaii Ocean Time Series			Station #: 2	Cast #: 9	Box #: 10
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS	
Niskin #	Depth	Serial #	Comments		
1	1020	221			
2	500	222	5-min		
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24	5	223			



## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GPS	12L	24.93	DM

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS  
☐ PO Fluorometer  
☐ mixed: 80  
 sal min: 500

Station: 2	Cast: 10
Latitude start: 22 45.037 end: 22 45.011	Longitude start: 157 59.998 end: 158 0.001
Depth of water: 4742 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.44 End: -0.47	Start Log: 1755 In Water: 1802 Out of Water: 1910
Max cast pressure: 1021 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	18:35:00	18:35:30	1019	1020	
2	45:30	46:00	499	500	s-min
3	52:30	53:00	179	175	
4		:10	176	175	
5	54:50	55:20	152	150	
6		:30	153	150	
7	57:00	57:30	122	125	
8		:40	123	125	
9	59:10	59:40	101	100	
10		:50	101	100	
11	19:01:20	19:01:50	75	75	
12		02:00	72	75	
13	03:50	04:20	44	45	
14		:30	46	45	
15	06:00	06:30	26	25	
16		:40	26	25	
17		:50	26	25	
18	08:30	09:00	8	5	
19		:10	8	5	
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 10	Box #: 10
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/J5/DR	
Niskin #	Depth	Serial #	Comments		
1	1020	224			
2	500	225	S-min		
3	175	226			
4					
5	150	227			
6					
7	125	228			
8					
9	100	229			
10					
11	75	230			
12					
13	45	231			
14					
15	25	232			
16					
17					
18	5	233			
19					
20					
21					
22					
23					
24					

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000 GPS	12L	25.06	DM

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer  
☐ sal min: 490  
           mixed: 65

\*sharp increase  
 in salinity at  
 600 dbar.

Station: 2	Cast: 11
Latitude start: 22 44.879 end: 22 44.858	Longitude start: 157 59.237 end: 157 59.242
Depth of water: 4738 meters	Date (GMT): 12 / 21 / 13
Pressure on Deck	Time:
Begin: -0.44 End: -0.48	Start Log: 2102 In Water: 2109 Out of Water: 2215
Max cast pressure: 1021 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	21:41:20	21:41:50	1021	1020	
2	52:10	52:40	491	490	s-min
3	59:10	59:40	174	[175]	
4		:50	173	[175]	
5	22:01:00	22:01:30	149	[150]	
6		:40	149	[150]	
7	02:40	03:10	125	[125]	
8		:20	127	[125]	
9	04:30	05:00	100	[100]	
10		:10	99	[100]	
11	06:20	06:50	77	[75]	
12		07:00	77	[75]	
13	08:00	08:30	47	[45]	
14		:40	45	[45]	
15	09:50	10:20	23	[25]	
16		:30	22	[25]	
17		:40	22	[25]	
18	12:10	12:40	7	[5]	
19		:50	8	[5]	
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 11	Box #: 10
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS/DR	
Niskin #	Depth	Serial #	Comments		
1	1020	234			
2	490	235			
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19	5	236			
20					
21					
22					
23					
24					

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000GPS	12L	25.25	DM/JG

Station: 2	Cast: 12
Latitude start: 22 44.899 end: 22 44.865	Longitude start: 157 57.306 end: 157 57.303
Depth of water: 4724 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.45 End: -0.45	Start Log: 0039 In Water: 0043 Out of Water: 0203
Max cast pressure: 1022 dbar	

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS  
☐ PO Fluorometer  
☐ S-min: 490  
           mixed: 40 dbar

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	01:18:50	01:19:20	1022	1020	
2		22:30	900	900	
3		25:10	796	800	
4		26:40	770	770	
5		29:05	699	700	
6		31:55	600	600	
7		35:20	498	500	
8		35:30	498	500	
9		37:00	490	490	S-min
10		40:10	399	400	
11		42:50	348	350	
12		44:55	300	300	
13		45:05	300	300	
14		47:15	251	250	
15		49:20	201	200	
16		49:30	199	200	
17		51:40	150	150	
18		53:20	126	125	
19		54:55	99	100	
20		56:25	76	75	
21		58:10	44	45	
22		02:00:00	25	25	
23		:10	25	25	
24		02:10	5	5	

Hawaii Ocean Time Series			Station #: 2	Cast #: 12	Box #: 10, 11
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: CF/JG/DZ	
Niskin #	Depth	Serial #	Comments		
x 1	1020	237			
2					
3					
4					
5					
6					
7					
8					
x 9		238	5-min		
10					
x 11	350	239			
12	7				
13					
x 14	250	240			
15					
16					
x 17	150	241			
x 18	125	242			
x 19	100	243			
x 20	75	244			
x 21	45	245			
x 22	25	246			
23					
x 24	5	247			



## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
91000GPS	12L	25.13	CP

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☒ BEACH Sea Tech Fluorometer  
☒ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer

☐ S-min: 500  
 Mixed Layer: 55

Station: 2	Cast: 13
Latitude start: 22 45.205 end: 22 45.242	Longitude start: 157 55.157 end: 157 55.068
Depth of water: 4712 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.48 End: -0.46	Start Log: 0257 In Water: 0303
Max cast pressure: 1022 dbar	Out of Water: 04:06

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1		03:35:35	1021	1020	
2		46:05	500	500	sal min
3		53:00	175	175	
4		54:20	151	150	
5		56:05	127	125	
6		57:40	101	100	
7		59:30	75	75	
8		06:01:30	45	45	
9		03:10	26	25	J
10		:20	26	25	
11		05:10	6	5	
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 13	Box #: 11
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler:	
Niskin #	Depth	Serial #	Comments		
1	1020	248			
2	sal mib	249			
3					
4					
5					
6					
7					
8					
9					
10					
11	5	250			
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					



## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G1000CIPS	12 L	24.96	CF/JG

- ☐ Pinger  
☐ Altimeter  
☐ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS  
☐ PO Fluorometer  
☐

Station: 2	Cast: 14
Latitude start: 22 45.243 end: 22 45.270	Longitude start: 157 54.935 end: 157 54.934
Depth of water: 4707 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.47 End: -0.49	Start Log: 06:01 In Water: 06:06 Out of Water: 07:11
Max cast pressure: 1020 dbar	

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	06:35:35	06:36:05	1020	1020	
2		47:05	501	500	sal min
3		54:25	177	175	
4		54:35	177	175	
5		55:50	153	150	
6		56:00	153	150	
7		57:05	135	135	
8		58:15	123	125	
9		58:25	123	125	
10		59:25	112	115	
11		07:00:55	98	100	
12		01:05	99	100	
13		02:15	86	85	
14		03:25	73	75	
15		03:35	74	75	
16		05:05	57	60	
17		06:15	45	45	
18		06:25	45	45	
19		07:55	24	25	
20		08:05	25	25	
21		10:30	6	5	
22		140	6	5	
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 14	Box #: 11/12
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler: DR/CF/JG	
Niskin #	Depth	Serial #	Comments		
1	1020	251			
2	500	252			
3	175	253			
4	175	254			
5	150	255			
6	150	256			
7	135	257			
8	125	258			
9	125	259			
10	115	260			
11	100	261			
12	100	262			
13	85	263			
14	75	264			
15	75	265			
16	60	266			
17	45	267			
18	45	268			
19	25	269			
20	25	270			
21	5	271			
22	5	272			
23					
24					

HOT- 258

## Hawaii Ocean Time-Series CONSOLE LOG

-DEEP CAST #2-

Cast type	Bottle type	SST	Operator
65000GPS	12	24.97	JG/CF

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☒ BEACH Sea Tech Fluorometer  
☒ OTG Seapoint Fluorometer  
☒ ISUS  
☒ PO Fluorometer  
☒ Mixed Layer - 35  
 Sal Min - 500

Station: 2	Cast: 15
Latitude start: 22 45.003	Longitude start: 157 59.995
end: 22 44.973	end: 157 59.997
Depth of water: 4742 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.42	Start Log: 0908
End: -0.60	In Water: 09:21
Max cast pressure: 4811 dbar	Out of Water: 12:53

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	11:09:45	11:10:15	4810	4800	5 m off bottom
2		17:20	4502	4500	
3		27:10	4001	4000	
4		27:20	4001	4000	
5		47:35	3003	3000	
6		47:45	3002	3000	
7		12:07:15	2000	2000	
8		07:30	2000	2000	
9		26:10	1001	1000	
10		30:45	819	820	O2 min
11		37:20	500	500	sal min
12		45:35	87	90	O2 max
13		49:10	25	25	
14	12:51:30	52:00	6	5	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 2	Cast #: 15	Box #: 12
Salinity Sample Log Sheet			Cruise #: HOT-258	Sampler: DM/JS	
Niskin #	Depth	Serial #	Comments		
1	4800	273			
2	4500	274			
3	4000	275			
4					
5	3000	276			
6					
7	2000	277			
8					
9		1			
10	820	278	O <sub>2</sub> min		
11	500	279	Sal min		
12	90	280	O <sub>2</sub> max		
13					
14	5	281			
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
6200 GPS	12L	25.00	DM

- ☒ Pinger  
☐ Altimeter  
☒ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS - Removed  
☒ PO Fluorometer  
☐ mixed: 50 dbar

Station: 52	Cast: 1
Latitude start: 22 39.748	Longitude start: 157 57.765
end: 22 39.903	end: 157 57.841
Depth of water: 4750 meters	Date (GMT): 12 / 22 / 13
Pressure on Deck	Time:
Begin: -0.43	Start Log: 1845
End: -0.43	In Water: 1850
Max cast pressure: 201 dbar	Out of Water: 1954

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1	19:50:00	19:50:30	25	25	
2		19:53:00	2	5	-surface water request. LTD
3					tripped ~ 10 seconds after
4					winch all-stop.
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 52	Cast #: 1	Box #:
Salinity Sample Log Sheet			Cruise #: HOT-	Sampler:	
Niskin #	Depth	Serial #	Comments		
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					



HOT-258

## Hawaii Ocean Time-Series CONSOLE LOG

Cast type	Bottle type	SST	Operator
G2500GPS	12L	25.51	SG/CF

- ☒ Pinger  
☒ Altimeter  
☒ Transmissometer  
☐ BEACH Sea Tech Fluorometer  
☐ OTG Seapoint Fluorometer  
☐ ISUS  
☒ PO Fluorometer  
☐

Station: 6	Cast: 1
Latitude start: 21 50.859 end: 21 50.806	Longitude start: 158 21.806 end: 158 21.793
Depth of water: 2464 meters	Date (GMT): 12/22/13
Pressure on Deck	Time:
Begin: -0.44	Start Log: 06:02
End: -0.45	In Water: 06:08
Max cast pressure: 2451 dbar	Out of Water: 08:09

Trip/ Niskin	Time stopped	Confirm tripped	Pressure	Target Depth	Comments
1		07:07:15	2450	2500	
2		07:17:30	2000	2000	
3		29:05	1500	1500	
4		39:55	1000	1000	
5		50:55	502	500	
6		58:20	177	175	
7		59:40	151	150	
8		08:06:55	125	125	
9		02:10	101	100	
10		03:35	75	75	
11		05:00	45	45	
12		06:05	25	25	
13		08:00	8	5	
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					

Hawaii Ocean Time Series			Station #: 6	Cast #: 1	Box #: 12/13
Salinity Sample Log Sheet			Cruise #: HOT- 258	Sampler:	
Niskin #	Depth	Serial #	Comments		
1	2500	282			
2	2000	283			
3	1500	284			
4	1000	285			
5	500	286			
6	175	287			
7	150	288			
8	125	289			
9	100	290			
10	75	291			
11	45	292			
12	25	293			
13	5	294			
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					



CTD Configurations

CTD: 850

Deck Unit: 111361

Pressure: 1430

Carousel: 518

T<sub>1</sub>: 1416T<sub>2</sub>: 5519C<sub>1</sub>: 2218C<sub>2</sub>: 2959O<sub>1</sub>: 918O<sub>2</sub>: 1601Pump<sub>1</sub>: 968Pump<sub>2</sub>: 368

Fluorometer: 3199

AHimeter: 9149

Bucket Thermometer: 201002

Transmissometer: -CST-1192 DR / C-STAR Wet Lab

Cruise Participants

A. Harlan

C. Schvarcz

D. Sadler

T. Young

B. Updyke

D. Fitzgerald

J. Snyder

D. McCoy

K. Björkman

S. Curless

C. Fumar

J. Gurn

S. Goldberg

D. Rosbrugh

B. Watkins

B. Barone

K. Doggett

Anne Thompson - BD Sciences (Seattle)

Erica Goetze - UH professor

Russell Hopcroft - U of Alaska

S. Thomas

0845	Depart
0915	Safety
1000	Fire
1138	Arrive
1443	Start
1229	End W
1254	Start
1013	End S
1021	Start
1058	End h
1102	Transi
0858	Arrive
0903	start [22° 44]
0923	End Sed
0937	Start
1010	End

1845 Depart SNUG Harbor

1915 Safety Meeting

2000 Fire and safety drill

2138 Arrive Fake point (Station 1)

2143 Start weight cast to 500m

2229 End weight cast

Jet Lab

2254 Start Station 1 cast 1 - G1000GPS

0013 End Station 1 cast 1 - 24 marks OK

d / OTG

0021 Start Hyperpro cast @  $21^{\circ}20.610'N$   $158^{\circ}16'44.2''W$

0058 End hyperpro cast @  $21^{\circ}20.003'N$   $158^{\circ}15.990'W$

0102 Transit ALOHA

0858 Arrive at station ALOHA

0903 start Sed Trap Deployment  
[ $22^{\circ}44.991'N$  ;  $158^{\circ}3.227'W$ ]

0923 End Sed Trap Deployment

bottle)

0937 Start NetTow (Erica Goetze)

1010 End Net Tow #1 / start Net Tow #2 (Blake)

\* Add to procedures binder before HOT-259

- ° Error w/ CBIRD-W on ACQ computer when DOS window isn't closed properly.
- ° To fix, copy 'Seasave.cfg' from comp desktop into D:/ctd-dos/prog
- ° Try to run the cast again

12/20/13 Transmissometer Calibration Notes:

22:33 UTC	<u>Dark Offset:</u>	<u>Uncovered Offset</u>
	volts = 0.07692	volts = 4.77167
	atten = 29.46162	atten = -0.06783

- \* To do Transmissometer test - start normal G-1000 GPS cast, look at values at "Voltage 7" and "Beam Attenuation, Chelson/Seatech/WET Lab, CStar, 2 [1/m]" on ACQ display in Fixed Display 2 & Fixed Display 1 respectively.

Thermosalinograph notes:

Low water pressure from thermosalinograph during first few hours of cruise. Had OTG fix water pressure in the underway seawater system @ 12/20/13 04:00:00 (GMT). Int and Ext temp offsets returned to expected ranges after. Consider removing all bottle samples before this time as they are likely outliers.

44 End Ne

50 start st  
• large swe  
slowed down

• ISUS has  
to 500

613 End state

621 Begin di

636 PD array

601 Start S

658 10m off

657 End sta

1900 Transit

2010 STA  
22°

2112 Start  
• ISUS  
was

• ISUS  
of 41

1044 End Net Tow

1150 Start Station 2 Cast 1 - G1000 GPS

- large swell (about 10 ft) in water, winch speeds slowed down. 20 m/min in upper 150 m.

- ISUS has noise/spikes in data (or) signal drop-outs to 500 dbar.

1313 End station 2 cast 1 - 22 marks OK

1421 Begin deploying PP array

1436 PP array deployed @  $22^{\circ}45.011'N$   $158^{\circ}2.020'W$

1501 Start Station 2 cast 2 - G5000 GPS

1658 10m off @  $22^{\circ}45.053'N$   $157^{\circ}59.979'W$  (4805 dbar)

1857 End station 2 cast 2 - 23 marks OK, 1 bad

1900 Transit pump tanks

2010 START NET TOW

$22^{\circ}42.14$   $158^{\circ}04.22$

2112 Start station 2 cast 3 - G1000 GPS

- ISUS not recording any data Package was re-installed prior to the cast

- ISUS data returns (low quality) @ 300 dbar of the downcast.

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Dec 20 2013

2242 End station 2 cast 3 - 23 marks OK / 1 bad  
RESET ISUS CABLE AT ISUS BULKHEAD

2318 Start net tow @ 22°45.022'N 157°59.996'W  
• For Erica Goetze

\* Delayed 15 minutes due to brake issues on  
the 680 winch.

2357 End net tow @ 22°44.953'N 157°59.392'W

Dec 21, 2013

0002 Deploy Hyperpro @ 22°44.959'N 157°59.342'W

0043 End hyperpro deployment @ 22°44.957'N 157°59.340'W

00:55 start station 2 cast 4 - 61000 GPS

02:11 End station 2 cast 4 - 14 marks ok

02:50 start station 2 cast 5 - 61000 GPS

04:05 End station 2 cast 5 - 14 marks ok

0430 start PP Array Recovery  
[22° 43.921'N ; 158° 2.291'W]

0438 Lost Ship's line on PP array, turning around to  
regrapple PP array

0458 New line on buoy; re-start PP Array Recovery  
[22° 43.965'N ; 158° 2.261'W]

0512 End PP Array Recovery

0515 PUMP RUN

0600 start

0729 End

0759 start

0828 End N

0852 End Ne

0900 start

1016 End

10:26 start

11:18 End Ne

1148 End N

1156 start e

1316 End start

1400 ETA  
22°

1451 start S

1613 (T) SW  
recovery

Niskins #7, 13 vents were found  
open after recovery. ←

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Dec 21, 2013

0600 start station 2 cast 6 - G1000GPS

0729 End station 2 cast 6 - 24 marks ok

0759 start Net Tow #1 (Blake)

0829 End Net Tow #1 / start Net Tow #2

0857 End Net Tow

0900 start station 2 cast 7 - G1000GPS

1016 End station 2 cast 7 - 11 marks ok

1026 start Net Tow #1 (Erica)

1118 End Net Tow #1 / start Net Tow #2

1148 End Net Tow #2

1156 start station 2 cast 8 - G1000GPS

1316 End station 2 cast 8 - 14 marks OK / 1 bad

1400 START G.A. DEPLOYMENT  
22° 42.57 158° 0253

1451 start station 2 cast 9 - G1000GPS

1618 CTD surfaced before taking 5m sample  
resubmerged to 15m to allow for pumps  
to turn back on, then took sample at 5m



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Dec 22, 13

1620 End Station 2 cast 9 - 22 marks Ok.  
2 marks bad due to > 5m oscillations

1630 Transit pump run

1755 Start Station 2 cast 10 - 61000 GPS  
- raining on station -

1910 Stop station 2 cast 10 - 19 marks Ok

1957 Start net tow @  $22^{\circ}45.030'N$   $157^{\circ}59.974'W$

2030 End net tow @  $22^{\circ}44.919'N$   $157^{\circ}59.340'W$

2035 Start ATE deployment  
-  $22^{\circ}44.914'N$   $157^{\circ}59.329'W$

2058 ATE recovered

2102 Start station 2 cast 11 - 61000 GPS

2116 End station 2 cast 11 - 19 marks Ok

2226 Net tow @  $22^{\circ}44.872'N$   $157^{\circ}59.199'W$   
- Blake -

2257 End net tow @  $22^{\circ}44.882'N$   $157^{\circ}58.707$

2302 Erica's Net tow @  $22^{\circ}44.883'N$   $157^{\circ}58.627'W$

2333 Net recovered @  $22^{\circ}44.887'N$   $157^{\circ}58.088'W$

2334 Erica's Net tow @  $22^{\circ}44.887'N$   $157^{\circ}58.063'W$

2359 Net recovered @  $22^{\circ}44.903'N$   $157^{\circ}57.895'W$



vents 4,6,7,8 were open



0002 Erica's 3

0030 End net

0039 Start S

0209 End st

0240 Transit to

0257 start  
- rain

0410 End s

0544 Shallow

0551 Net To

0601 start

0716 End

0720 Transit

0730 Start<sup>E</sup>

0800 End Ne

08:08 Start E

Dec 22nd, 2013

0002 Erica's 3rd net tow @  $22^{\circ}44.902'N$   $157^{\circ}57.856'W$

0030 End net tow @  $22^{\circ}44.903'N$   $157^{\circ}57.349'W$

0039 Start Station 2 cast 12 - G1000 GPS

0209 End Station 2 cast 12 - 24 marks ok

0210 Transit to pump tanks

0257 start station 2 Cast 13 - G1000 GPS  
- rain on station just before cast

0410 End Station 2 Cast 13 - 11 marks ok

0544 Shallow Net Tow in water @  $22^{\circ}45.224'N$ ,  
 $157^{\circ}55.068'W$

0559 Net Tow out of water

0601 start Station 2 Cast 14 - G1000 GPS

0716 End Station 2 Cast 14 - 22 marks ok

0720 Transit to center

0730 Start <sup>Erica's</sup> Net Tow @  $22^{\circ}45.085'N$ ,  $157^{\circ}56.688'W$

0800 End Net Tow

0808 Start Blake Net Tow @  $22^{\circ}45.127'N$   $157^{\circ}57.414'W$

0830 End Net Tow

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Dec 22, 2013

0843 start Net Tow

0900 End Net Tow

0901 Transit to center (~2 miles)

0908 start Station 2 Cast 15 - G5000CIPS  
- Deep Cast #2 -

11:10 Reached 4810 dbar @  $22^{\circ}44.976'N$ ,  $157^{\circ}59.987'W$   
(5m off bottom)

1254 End station 2 cast 15 - 14 marks OK

1308 Start AC9/FRRF @  $22^{\circ}44.975'N$   $157^{\circ}59.998'W$

1358 AC9 recovered

1402 AC9 re-deployed @  $22^{\circ}44.976'N$   $157^{\circ}59.999'W$

1454 AC9 recovered

1500 Transit gas array

1600 Gas array recovered @  $22^{\circ}41.994'N$   $158^{\circ}1.483'W$

1607 Transit sediment traps

1655 Sediment traps recovered @  $22^{\circ}44.567'N$   $158^{\circ}3.733'W$

1705 Transit pump run

1845 Start station 52 cast 1 - G200 GPS  
- WHOTS mooring cast -

1855 start cycle #1

1913 start cycle #2

1931 start cycle #3

cycles #4 & 5 cancelled due to AC9/FERF

1956 End station 52 cast 1 - 2 marks OK

2006 Deploying AC9 @  $22^{\circ}39.849'N$   $157^{\circ}57.959'W$

2059 AC9 recovered

2103 AC9 re-deployed @  $22^{\circ}39.816'N$   $157^{\circ}57.956'W$

2155 AC9 recovered

2209 Net tow (Erica) @  $22^{\circ}39.801'N$   $157^{\circ}57.933'W$

2220 Net recovered

2355 START HYPER PRO  
 $22^{\circ}39.81$   $157^{\circ}57.90$

December 23, 2013

0045 Hyperpro recovered

0100 Deploy Erica's Net Tow @  $22^{\circ}39.809'N$ ,  $157^{\circ}57.876'W$

0111 End Net Tow

0114 Start transit to Kaena

0558 Arrive at St. 6 Kaena

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0602 Start Station 6 Cast 1 - G2500GPS

0707 10m off bottom (2450dbar) @ 21 50.814°N, 158 21.793°W

0812 End Station 6 Cast 1 - marks ok

0815 Transit to Snug Harbor

## CCHDO Data Processing Notes

Date	Person	Data Type	Action	Summary
2014-10-08	Diggs, Steve	CTD/BTL/DOC	Submitted	WOCE formatted data
	One ZIP archive includes WOCE formats for CTD and BOT. Two cruise reports included. ExpoCode needs to be changed from 33KB258/1 to 33KB20131219.			