

Healy Cruise HLY11TA ADCP:

ADCP Acquisition and Processing Settings

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Revision History

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1 Introduction

USCGC Healy has two Doppler current profilers made by Teledyne RDI. These instruments are used to calculate ocean currents beneath the ship. Data acquisition and processing use the “UHDAS” system, written at the University of Hawaii. This system was upgraded to a Matlab-free version prior to HLY11TA. This cruise was the shakedown cruise for the 2011 science season. The ship sailed from Seattle to San Francisco and back, with several opportunities for evaluation of calibration, bias, and range.

1.1 Computer

The computer is a 1-U rackmount computer running linux Ubuntu 9.04 (Lucid Lynx). All data input through an 8-port USB serial device with an FTDI chip, manufactured by VSCOM. Acquisition and processing are done with a combination of Python and C. Although the Matlab code previously in use still works in all regards, it is no longer used for at-sea systems.

1.2 ADCPs

The Healy has a 75kHz phased array ADCP (“Ocean Surveyor”, denoted OS75). That has been in place since 2002. A 150kHz phased array (“OS150”) loaned by Univ Alaska, Fairbanks, was installed prior to the 2010 season.

2 Data from HLY11TA

Serial inputs are the same as 2010. The transducers have not been removed from their wells, so the transducer orientation is still good (relevant to the EA command). ADCP data were collected with several different settings. There were 4 segments, started for different reasons.

2.1 UHDAS Data Acquisition:

Data for scientists:

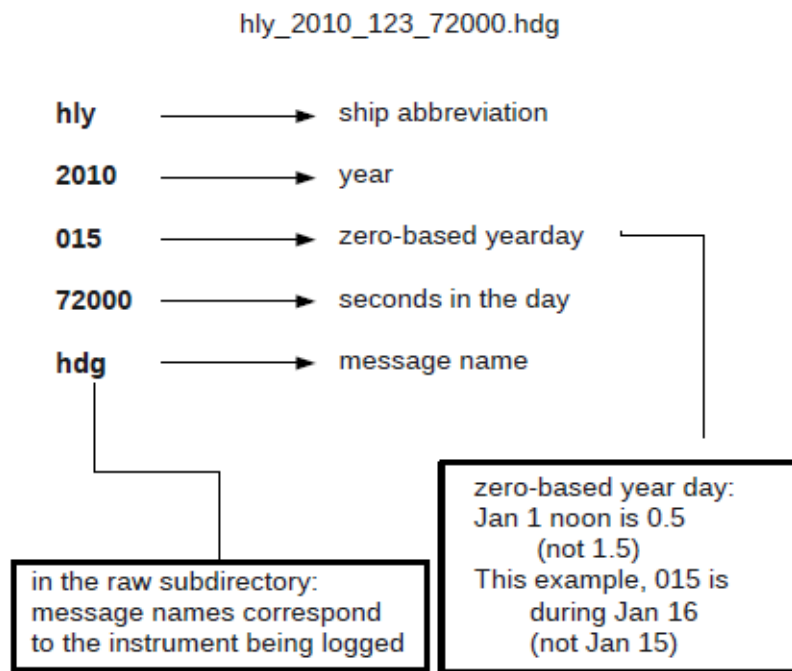
There are three categories of data, all located in the logging directory, /home/data/[CRUISEID]:

ADCP logging directories

subdirectory	contents	importance	back up for...
raw	all raw data	critical	<ul style="list-style-type: none"> ◦ archiving ◦ scientists who ask for it
rbin	intermediate files	nice to have	anyone who gets raw
gbin	intermediate files	nice to have	anyone who gets raw
proc	<ul style="list-style-type: none"> ◦ final processing ◦ codas database ◦ underway figure archive ◦ matlab files 	final product	science CDs after cruise

Data in the “raw” subdirectory are organized with one directory per serial port. Files start when data acquisition starts, and roll over on every 2-hour boundary thereafter.

Serial directory	instrument	suffix	messages
ashpaq5	Ashtech adu5	paq	\$GPGGA,\$GPPAT
gpsnav	Pcode gps	gps	\$GPGGA
gyro	Sperry mk39	hdg	\$INHDT
gyro2	Sperry mk27	hdg	\$HEHDT
os150	RDI adcp (150kHz)	raw, log, log.bin	(binary adcp data + log files)
os75	RDI adcp (75kHz)	raw, log, log.bin	(binary adcp data + log files)
posmv	POSMV	pmv	\$PASHR,\$INGGA



Naming convention for UHDAS raw files

2.2 UHDAS (CODAS) data processing parameters

The processing component of UHDAS is called “CODAS” (Common Ocean Data Access System). Extensive documentation about CODAS processing exists

- at sea, on ships with UHDAS installed (<http://currents>)
- on land (http://currents.soest.hawaii.edu/docs/adcp_doc/index.html)

UHDAS data acquisition results in four directories, representing different stages of acquisition/processing. 'Raw', described above, consists of timestamped NMEA messages. Subdirectories 'rbin' and 'gbin' are intermediate (parsed) versions of data in 'raw'. The 'proc' directory contains one directory tree for each instrument+pingtype being processed. This directory tree and the processing steps that occur in it, are described in the CODAS documentation.

Processing is done using programs written in Python and C . Parameters used by Python

processing are found in each processing directory in a file such as:

- `proc/os150nb/config/HLY11TA_01_proc.py`

The processing directories retain the old Matlab-based configuration files as well:

- `proc/os150nb/config/HLY11TA_01_cfg.m`
- `proc/os150nb/config/HLY11TA_01_proc.m`

The same processing parameters (transducer depth, transducer alignment angle, and serial Processing parameters used during the original HLYT11TA segments are in the Appendix.

3 Appendices

3.1 Appendix: HLY11TA ADCP Cruise segments (time ranges)

cruise name	date range	comment
HLY11TA_01	2011-04-25 19:23 2011-04-27 15:46	depart Seattle
HLY11TA_02	2011-04-27 15:46 2011-04-28 20:36	changed transducer cable orientation
HLY11TA_03	2011-05-02 18:10 2011-05-04 17:59	depart San Francisco test os75nb spare deck unit (1787)
HLY11TA_04	2011-05-04 18:04 (seattle)	evaluate 2011 season defaults change back to original os75 deck unit (712)

3.2 Appendix: HLY11TA ADCP Processing parameters

name	heading (reliable)	best position	hcorr_inst (accurate)	h_align os75	h_align os150
HLY11TA_01	posmv	gposmv	(none)	43.4	28.4
HLY11TA_02	posmv	gposmv	(none)	43.4	28.4
HLY11TA_03	posmv	gposmv	(none)	43.4	28.4
HLY11TA_04	posmv	gposmv	(none)	43.4	28.4

3.3 Appendix: HLY11TA ADCP Acquisition parameters

c= chunk number
 N= number of files in chunk
 decimal day start, end
 BT= bottom track status (on, off)
 (ping, Number of bins, bin size (m), blank (m), pulse (m))

c N startddd endddd BT (ping, N, Size, Blank, Pulse)(ping, N, Size, Blank, Pulse)

===== HLY11TA_01 =====

```
----- (os150) -----
0 2 114.808613 114.868992 on (bb, 70, 4.0, 4.0, 4.0)
1 11 114.869507 115.601764 on (bb, 70, 4.0, 4.0, 4.0) (nb, 70, 8.0, 4.0, 8.0)
2 7 115.602193 116.142532 off (bb, 50, 4.0, 4.0, 4.0) (nb, 40, 8.0, 4.0, 8.0)
3 7 116.143132 116.656876 off (bb, 50, 4.0, 5.0, 4.0) (nb, 40, 8.0, 5.0, 8.0)
----- (os75) -----
0 2 114.808610 114.868984 off (bb, 80, 8.0, 8.0, 8.0)
1 11 114.869546 115.601732 on (bb, 80, 8.0, 8.0, 8.0) (nb, 70, 16.0, 8.0, 16.0)
2 14 115.602217 116.656882 off (bb, 70, 8.0, 8.0, 8.0) (nb, 50, 16.0, 8.0, 16.0)
```

===== HLY11TA_02 =====

```
----- (os150) -----
0 17 116.657707 117.797373 off (bb, 50, 4.0, 5.0, 4.0) (nb, 40, 8.0, 5.0, 8.0)
1 2 117.797888 117.858559 off (bb, 30, 2.0, 5.0, 2.0) (nb, 20, 4.0, 5.0, 4.0)
----- (os75) -----
0 17 116.657729 117.797349 off (bb, 70, 8.0, 8.0, 8.0) (nb, 50, 16.0, 8.0, 16.0)
1 2 117.797898 117.858569 off (bb, 30, 4.0, 8.0, 4.0) (nb, 10, 8.0, 8.0, 8.0)
```

===== HLY11TA_03 =====

```
----- (os150) -----
0 16 121.758278 122.866489 on (bb, 50, 4.0, 5.0, 4.0) (nb, 40, 8.0, 5.0, 8.0)
1 14 122.871771 123.660404 off (bb, 50, 4.0, 5.0, 4.0) (nb, 40, 8.0, 5.0, 8.0)
2 2 123.661380 123.720680 off (nb, 40, 4.0, 5.0, 4.0)
3 3 123.721181 123.739543 on (bb, 50, 4.0, 5.0, 4.0) (nb, 40, 8.0, 5.0, 8.0)
----- (os75) -----
0 16 121.758319 122.866467 on (bb, 70, 8.0, 8.0, 8.0) (nb, 50, 16.0, 8.0, 16.0)
1 19 122.871793 123.739477 off (bb, 70, 8.0, 8.0, 8.0) (nb, 50, 16.0, 8.0, 16.0)
```

===== HLY11TA_04 =====

```
----- (os150) -----
0 17 123.754222 125.060456 off (nb, 80, 4.0, 5.0, 4.0)
1 2 125.060855 125.149463 off (nb, 40, 8.0, 5.0, 8.0)
2 6 125.149906 125.536475 off (nb, 80, 4.0, 5.0, 4.0)
----- (os75) -----
0 25 123.754256 125.536474 off (bb, 70, 8.0, 8.0, 8.0) (nb, 50, 16.0, 8.0, 16.0)
```