Marine Mammals Tracking - MMT

Processing and Delivery report

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Content

1   Introduction

In January 2016, four Weddell seals (*Leptonychotes weddellii*) were equipped with ARGOS Platform Transmitter Terminals (PTTs) during the RV "Polarstern" cruise PS96 (ANT-XXXI/2) in the Weddell Sea. The ARGOS satellite system provides positioning information during transmission and enables the download of different processing-level products via their web-interface.

All PTTs were additionally capable to measure dive activities and temperature as well as salinity of the water column (CTD). Information on the positions with location accuracy flags and additional dive/CTD date was obtained from the website of the Sea Mammal Research Unit (SMRU).

2   Workflow

2.1   Data retrieval

The SMRU data were downloaded from the website (http://www.smru.st-andrews.ac.uk/) as MS Access Databases (named "ct113.mdb" and "wd07.mdb") and subsequently processed.

2.2 Data processing

Raw position information was retrieved from the table "diag" which offers positioning information and quality flags of the location accuracy. The workflow is presented in Figure 1.
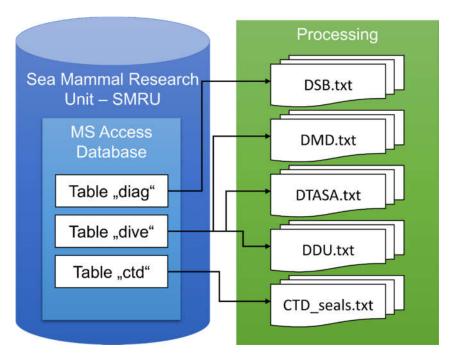

Figure 1: Processing of data towards PANGAEA-formatted files

The datasets of each PTT were excised according to provided starting date/time after the anesthesia of the animals and subsequent fitting of the instruments. The following dates/times determined the start of valid data (Table 1).

Table 1: Start date/time for the PTTs

Event label	PTT	Start DateTime (ISO 8601)
DRE2015_wed_a_m_06	142938	2016-01-21T12:40:14
DRE2015_wed_a_f_07	142939	2016-01-21T12:42:42
DRE2015_wed_a_f_08	130064	2016-01-22T15:26:22
DRE2015_wed_a_m_10	146620	2016-01-23T15:41:30

3   Processing Report

3.1   File description

Table 2: Description of the delivered PANGAEA files

File	Description	columns
DSB.txt	Surface behaviour	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Pos type
DMD.txt	Maximum depth	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Dive, maximum depth [m]
DTASA.txt	Absolute time at surface	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Dive, time at surface, absolute [min]
DDU.txt	Dive duration	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Dive, duration [min]
CTD_seals.txt	CTD data	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Depth, water [m] 6. Pressure, water [dbar] 7. Temperature, water [deg C] 8. Salinity[]@PSU

3.2 DSB.txt

A total number of 3044 messages was received and written to the file "DSB.txt". The average lifetime of the four PTTs was 140.5 days (with a range from 75 to 204 days). The average amount of messages per day was 7. Table 3 gives a summary of all processed data. Detailed maps and histograms of the location accuracies of the received messages are provided in the appendix (chapter 0).

Table 3: Summary of the processed PTTs

Event label	First DateTime	Last DateTime	lifetime (days)	messages
DRE2015_wed_a_m_06	2016-01-21T12:40:14	2016-06-09T11:37:13	140	1101
DRE2015_wed_a_f_07	2016-01-21T12:42:42	2016-06-12T00:52:48	143	218
DRE2015_wed_a_f_08	2016-01-22T15:26:22	2016-08-13T10:52:29	204	684
DRE2015_wed_a_m_10	2016-01-23T15:41:30	2016-04-06T18:19:18	75	1041

3.3 Dive behaviour

Information of the dive behaviour is given in the output files "DMD.txt", "DTASA.txt", and "DDU.txt". These data were extracted from the table "dive" of the MS Access databases "ct113.mdb" and "wd07.mdb" and were available for all PTTs. The number of entries is shown in Table 4:

Table 4: Entries of the dive behavior files

Event label	PTT	entries
DRE2015_wed_a_m_06	142938	3725
DRE2015_wed_a_f_07	142939	635
DRE2015_wed_a_f_08	130064	1935
DRE2015_wed_a_m_10	146620	1493

3.4 CTD

CTD data is available for all PTTs, a summary of the entries is given in Table 5.

Table 5: Available CTD data

DRE2015_wed_a_m_06	PTT	entries
DRE2015_wed_a_f_07	142938	4475
DRE2015_wed_a_f_08	142939	672
DRE2015_wed_a_m_10	130064	1628
DRE2015_wed_a_m_06	146620	4945

4   Appendix

4.1   Location accuracy classes

ARGOS location class	PANGAEA location accuracy	Description
	1	Interpolated position
B	2	No estimate of location accuracy
A	3	No estimate of location accuracy
0	4	Estimated location accuracy > 1000 m
1	5	Estimated location accuracy 350 – 1000 m
2	6	Estimated location accuracy 150 – 350 m
3	7	Estimated location accuracy < 150 m

4.2   Maps and histograms of all processed Weddell seals

DRE2015_wed_a_m_06 (PTT ID: 142938)

DRE2015_wed_a_m_06 (from 2016/01/21 to 2016/06/09)

DRE2015_wed_a_f_07 (PTT ID: 142939)

DRE2015_wed_a_f_07 (from 2016/01/21 to 2016/06/12)

DRE2015_wed_a_f_08 (PTT ID: 130064)

DRE2015_wed_a_f_08 (from 2016/01/22 to 2016/08/13)

DRE2015_wed_a_m_10 (PTT ID: 146620)

DRE2015_wed_a_m_10 (from 2016/01/23 to 2016/04/06)