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Marine Mammals Tracking - MMT

Processing and Delivery report

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1 Introduction

In January 2016, seven Ross seals (*Ommatophoca rossii*) were equipped with ARGOS Platform Transmitter Terminals (PTTs). The ARGOS satellite system provides positioning information during transmission and enables the download of different processing-level products via their web-interface. Six PTTs were additionally capable to measure dive activities and/or temperature of the water column. Information on the positions with location accuracy flags and additional dive data was obtained from the website of Wildlife Computers.

2 Workflow

2.1 Data retrieval

The datasets can be downloaded from the website <https://wildlifecomputers.com> as individual CSV-Files for each PTT. For post processing, the data were delivered as combined CSV-Files including the information of all PTTs.

2.2 Data processing

Raw position information was retrieved from the File “ARGOS.csv” which offers positioning information and quality flags of the location accuracy. These positions were subsequently interpolated linearly into a regular 10-minute-intervall and saved as “10min_interpolated.txt”. These interpolated positions were appended to dive-information according to the time stamps. The workflow is presented in Figure 1.

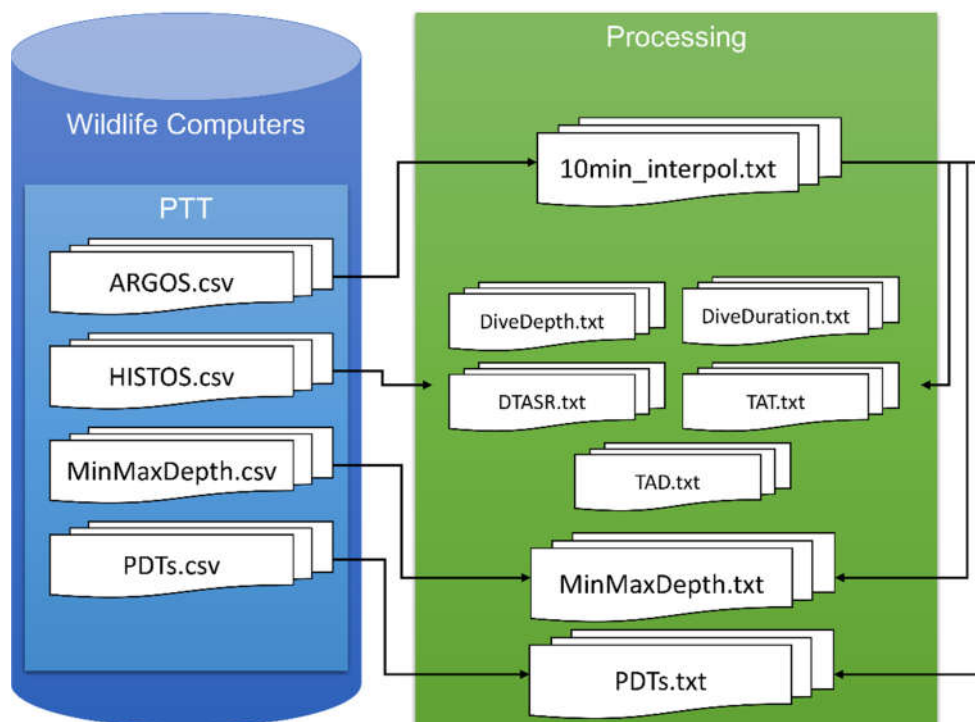


Figure 1: Processing of data towards PANGAEA-formatted files

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)
S552016_ros_a_f_02	152416	2016-01-13T13:29:09
S552016_ros_a_f_11	152418	2016-01-22T12:08:59
S552016_ros_a_f_12	152414	2016-01-22T13:45:55
S552016_ros_a_f_15	152419	2016-01-22T19:31:19
S552016_ros_a_f_18	152413	2016-01-23T14:28:02
S552016_ros_a_f_19	152423	2016-01-23T20:47:01
S552016_ros_a_m_21	152422	2016-01-27T16:09:02

3 Processing Report

3.1 File description

Table 2: Description of the delivered PANGAEA files

File	Description	columns
Argos.txt	Surface behaviour	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Pos type
DiveDepth.txt	Dive depths frequencies	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Depth, water [m] 6. DDF [#] 7. Pos type
DiveDuration.txt	Dive duration frequencies	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. DTI [min] 6. DD [#] 7. Pos type
DTASR.txt	Dive-Time at surface-Ratio	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. DTASR [%] 6. Pos type
MinMaxDepth.txt	Dive maximum depth	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. DMD [m] 6. Pos type
PDTs.txt	Min- and Max-Temperature per depth	1. Event label 2. Date/Time 3. Latitude

		4. Longitude 5. Depth, water [m] 6. TEMP [°C] MIN 7. TEMP [°C] MAX 8. Pos type
TAD.txt	Time at depth	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. Depth, water [m] 6. DTD [min] 7. Pos type
TAT.txt	Time at temperature	1. Event label 2. Date/Time 3. Latitude 4. Longitude 5. DTR [°C] 6. DTT [min] 7. Pos type

3.2 Argos.txt

A total number of 32142 messages was received and written to the file “Argos.txt”. The average lifetime of the PTTs was 192 days (with a range from 36 to 358 days). The average amount of messages per day was 23. 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 4).

Table 3: Summary of the processed PTTs

Event label	First DateTime	Last DateTime	lifetime (days)	messages
S552016_ros_a_f_02	2016-01-13T13:29:09	2016-02-18T06:19:18	36	988
S552016_ros_a_f_11	2016-01-22T12:08:59	2017-01-13T14:07:15	358	9848
S552016_ros_a_f_12	2016-01-22T13:45:55	2016-05-16T13:07:46	115	3313
S552016_ros_a_f_15	2016-01-22T19:31:19	2016-03-19T20:28:22	58	642
S552016_ros_a_f_18	2016-01-23T14:28:02	2016-07-17T07:47:20	176	3827
S552016_ros_a_f_19	2016-01-23T20:47:01	2017-01-06T21:39:37	350	7326
S552016_ros_a_m_21	2016-01-27T16:09:02	2016-10-06T22:35:40	254	6198

3.3 Dive behaviour

Information of the dive behaviour is given in the output files “DiveDepth.txt”, “DiveDuration.txt”, “TAT.txt”, “TAD.txt”, “MinMaxDepth.txt”, and “DTASR.txt”. These data were extracted from the files “Histos.csv” and “MinMaxDepth.csv” and were available for up to six PTTs. The number of entries is shown in Table 4.

Table 4: Entries of the dive behaviour files

Event label	DiveDepth	DiveDuration	TAT	TAD	MinMaxDepth	DTASR
S552016_ros_a_f_02	1908	2128	2296	1860	98	
S552016_ros_a_f_11	5868	5844	7098	6565	595	1715
S552016_ros_a_f_12						1350
S552016_ros_a_f_15	7605	8302	7840	6890	723	1858
S552016_ros_a_f_18						5284
S552016_ros_a_f_19						4532

3.4 PDTs.txt

Data of depth and temperature is available for two PTTs, a summary of the entries is given in Table 5.

Table 5: Available CTD data

Event label	entries
S552016_ros_a_f_12	2965
S552016_ros_a_f_18	3854

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 Ross seals

