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Initial ADCP Preparation Report

Issue 01

February 2021

Loch Long Salmon

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PART OF THE SAMSgroup

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Revision History

Revision	Originator	Checked	Approved	Date
A	[redacted]			05/02/2021
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Revision	Changes
A	First internal draft for review
01	First issue to customer

[redacted]

Acronyms & Abbreviations

ADCP	Acoustic Doppler Current Profiler
SAMS	Scottish Association for Marine Science
SBA	Simply Blue Aquaculture Ltd.
SEPA	Scottish Environment Protection Agency
SRSL	SAMS Research Services Ltd.

1 ADCP DATA PREPARATION

1.1 Raw data

1.1.1 ADCP data was provided, as Excel spreadsheets, by SBA.

1.1.2 Data was collected from 13:20 18/06/2020 to 11:45 30/07/2020, see **Figure 1**.

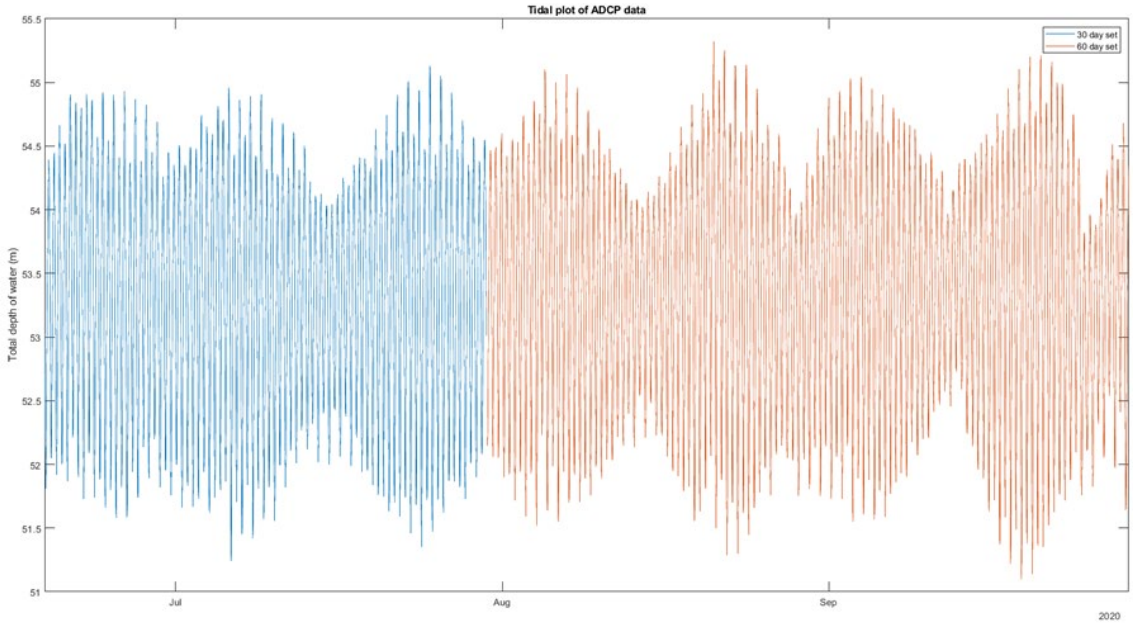

Figure 1: Height of water; blue - first (30-day) deployment, red - second (60-day) deployment.

1.2 Repaired data

1.2.1 Data was stitched together by removing the data collected between 08:35 and 11:45, and between 13:20 and 20:55 on 30/07/2020. This allowed data to be joined at the same point in the tidal cycle (~12 hours apart), see **Figure 2** and **Figure 3**.

1.2.2 For the magnitude and direction data a moving average was taken, using MATLAB, with a 20-minte window in order to remove some 'noise'. This also filled in some of the missing data points, see **Figure 4**.

1.2.3 The MATLAB function `interp1` (MATLAB 2020) was then used to fill in all remaining gaps.

1.3 Data bins

1.3.1 The mean depth of the water is 53.323 m. The port depths on the cage are at 30 m and 42 m. At mean depth the ports are 23.3 m and 11.3 m above the seabed.

1.3.2 The closest bin to the seabed is the 3.1 m bin, so this was chosen as the deepest data set. For the mid-water column depths the bins nearest the pots were chosen, namely 11.1 m and 23.1 m, as middle-deep and middle-shallow respectively. For the near-surface data the shallowest bin with relatively complete data (before repairing was

chosen): the 38.1 m bin required less than 1% of the data to be repaired by `interp1` and so this was chosen.

1.4 Data checking

1.4.1 The SEPA provided HGdata_anaylsis Excel sheet (SEPA 2019) was used to check data. As residual flow was <35% at deepest bin (and in two of remining three), the residual flow was not removed from the data.

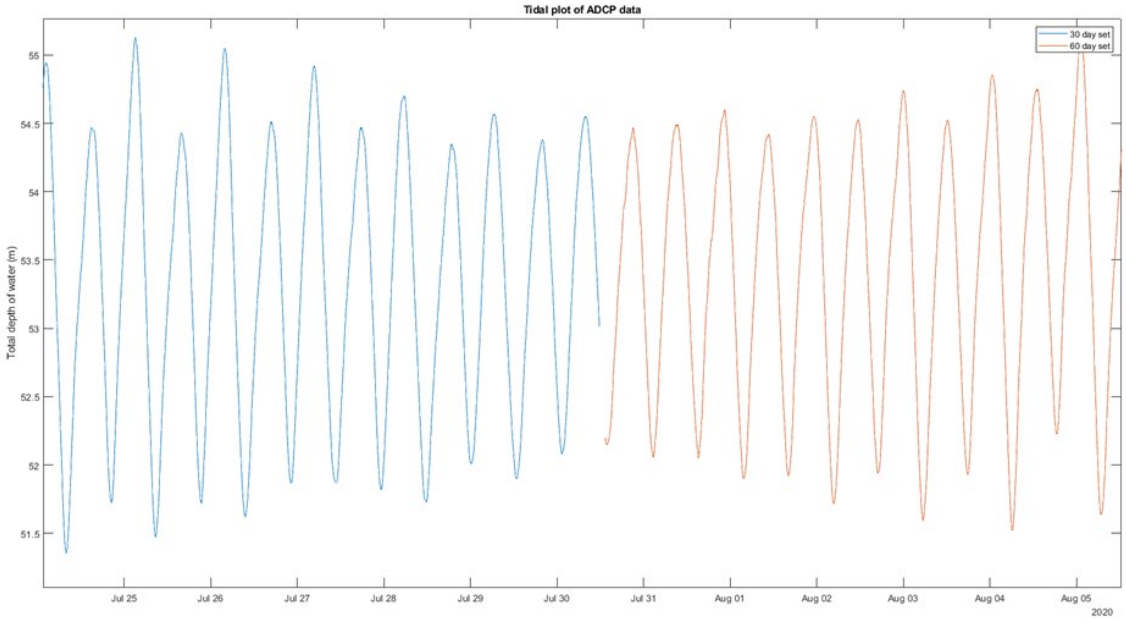

Figure 2: Unstitched data

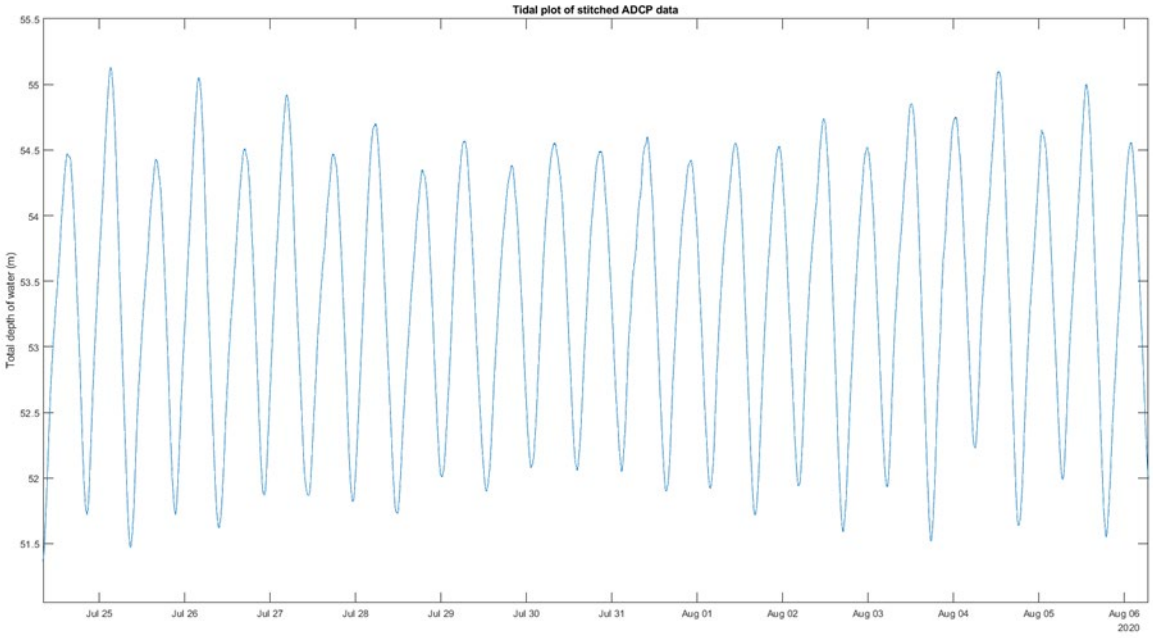

Figure 3: Stitched data

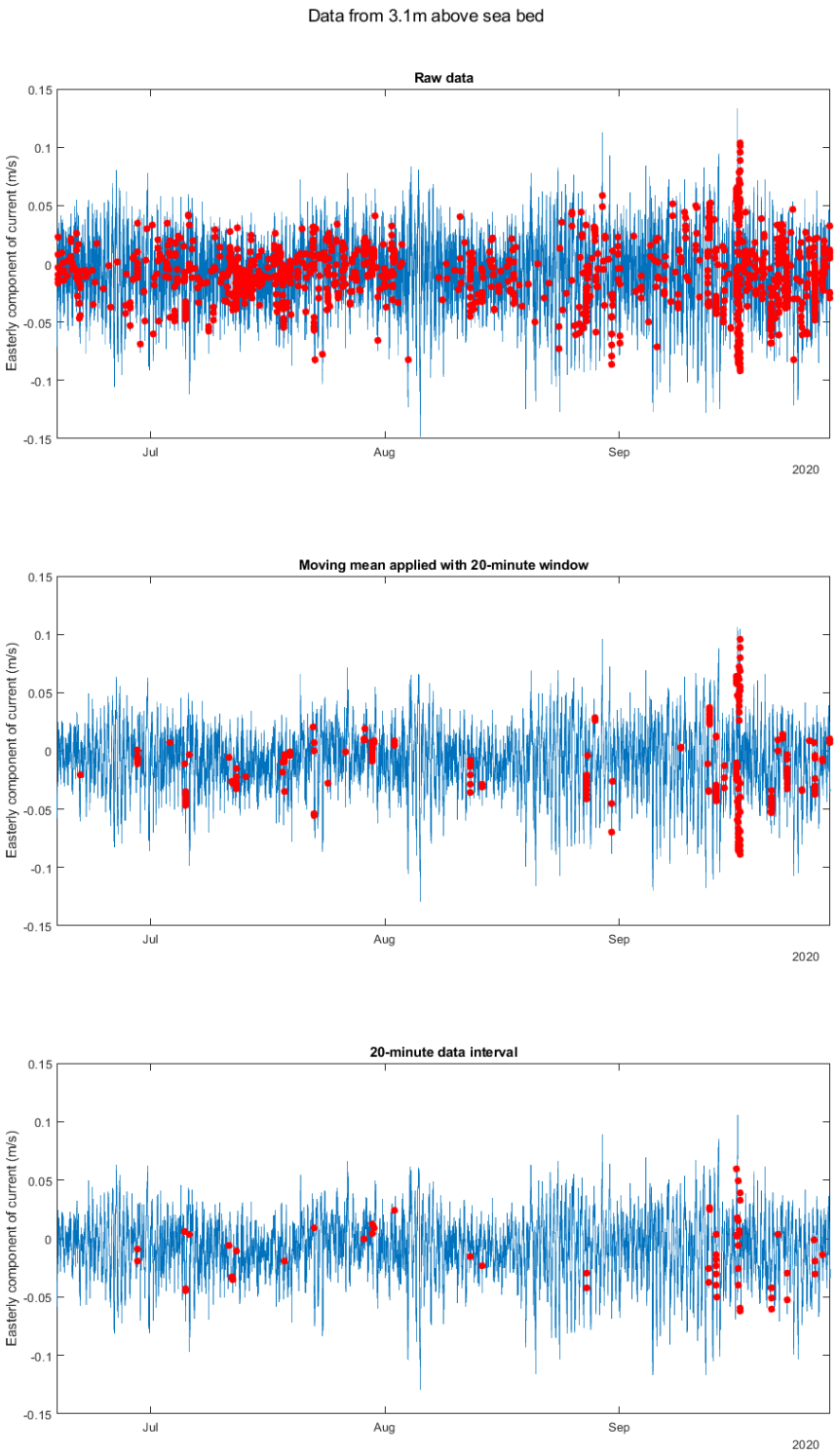

Figure 4: Comparison of data through repairing; top - raw data (blue), with missing points highlighted (red), middle – data after moving mean applied (blue), with missing points highlighted (red), bottom – 20-minute time series (if interp1 function not used) (blue), with missing points highlighted (red).

2 REFERENCES

MATLAB (2020) interp1 – 1-D data interpolation
https://www.mathworks.com/help/matlab/ref/interp1.html

SEPA (2019) – HGdata_analysis_v7

https://www.sepa.org.uk/regulations/water/aquaculture/pre-june-2019-guidance/aquaculture-environment/modelling/