

## **Cell 1 Regional Coastal Monitoring Programme Update Report 12: 'Partial Measures' Survey 2020**



**North Tyneside Council**

**March 2020**

## Contents

Disclaimer .....	i
Abbreviations and Acronyms.....	ii
Water Levels Used in Interpretation of Changes .....	ii
Glossary of Terms.....	iii
Preamble .....	iv
1. Introduction.....	1
1.1 Study Area .....	1
1.2 Methodology.....	1
2. Analysis of Survey Data .....	3
2.1 Whitley Sands .....	3
2.2 Cullercoats Bay .....	5
2.3 Tynemouth Long Sands .....	6
2.4 King Edward’s Bay .....	8
3. Problems Encountered and Uncertainty Analysis.....	9
4. Recommendations for ‘Fine-tuning’ the Monitoring Programme .....	9
5. Conclusions and Areas of Concern .....	9

## Appendices

Appendix A	Beach Profiles
Appendix B	Topographic Survey

## List of Figures

Figure 1	Sediment Cells in England and Wales
Figure 2	Survey Locations

## List of Tables

Table 1	Analytical, Update and Overview Reports Produced to Date
Table 2	Sub-division of the Cell 1 Coastline

Authors	
Alix Scullion	Royal HaskoningDHV
Dr Nick Cooper – Review & Approval	Royal HaskoningDHV

## Disclaimer

Royal HaskoningDHV has prepared this report in accordance with the instructions of our client Scarborough Borough Council (SBC) for the client's sole and specific use. Any other persons who use any information contained herein do so at their own risk. Royal HaskoningDHV has used reasonable skill, care and diligence in the interpretation of data provided to them and accepts no responsibility for the content, quality or accuracy of any Third party reports, monitoring data or further information provided either to them by SBC or, via SBC from a Third party source, for analysis under this term contract.

Data and reports collected as part of the Cell 1 Regional Coastal Monitoring Programme are available to download via the North East Coastal Observatory via the webpage: [www.northeastcoastalobservatory.org.uk](http://www.northeastcoastalobservatory.org.uk).

The North East Coastal Observatory does not "license" the use of images or data or sign license agreements. The North East Coastal Observatory generally has no objection to the reproduction and use of these materials (aerial photography, wave data, beach surveys, bathymetric surveys, reports), subject to the following conditions:

1. North East Coastal Observatory material may not be used to state or imply the endorsement by North East Coastal Observatory or by any North East Coastal Observatory employee of a commercial product, service, or activity, or used in any manner that might mislead.
2. North East Coastal Observatory should be acknowledged as the source of the material in any use of images and data accessed through this website, please state "Image/Data courtesy of North East Coastal Observatory". We recommend that the caption for any image and data published includes our website, so that others can locate or obtain copies when needed. We always appreciate notification of beneficial uses of images and data within your applications. This will help us continue to maintain these freely available services. Send e-mail to [Robin.Siddle@scarborough.gov.uk](mailto:Robin.Siddle@scarborough.gov.uk)
3. It is unlawful to falsely claim copyright or other rights in North East Coastal Observatory material.
4. North East Coastal Observatory shall in no way be liable for any costs, expenses, claims, or demands arising out of the use of North East Coastal Observatory material by a recipient or a recipient's distributees.
5. North East Coastal Observatory does not indemnify nor hold harmless users of North East Coastal Observatory material, nor release such users from copyright infringement, nor grant exclusive use rights with respect to North East Coastal Observatory material.
6. North East Coastal Observatory material is not protected by copyright unless noted (in associated metadata). If copyrighted, permission should be obtained from the copyright owner prior to use. If not copyrighted, North East Coastal Observatory material may be reproduced and distributed without further permission from North East Coastal Observatory.

## Abbreviations and Acronyms

Acronym / Abbreviation	Definition
AONB	Area of Outstanding Natural Beauty
DGM	Digital Ground Model
HAT	Highest Astronomical Tide
LAT	Lowest Astronomical Tide
MHWN	Mean High Water Neap
MHWS	Mean High Water Spring
MLWS	Mean Low Water Neap
MLWS	Mean Low Water Spring
m	metres
ODN	Ordnance Datum Newlyn

## Water Levels Used in Interpretation of Changes

Water Level Parameter	Water Level (m AOD)
	River Tyne
1 in 200 year	3.7
HAT	3.1
MHWS	2.4
MLWS	-1.9

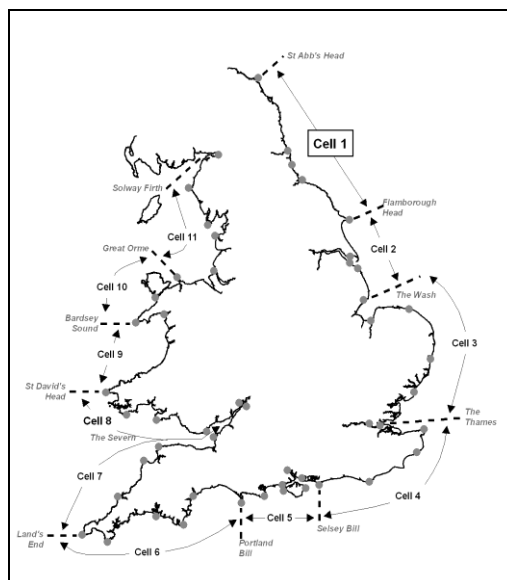
**Source:** *Scottish Border to River Tyne Shoreline Management Plan 2.*  
Royal Haskoning, May 2009.

## Glossary of Terms

Term	Definition
Beach nourishment	Artificial process of replenishing a beach with material from another source.
Berm crest	Ridge of sand or gravel deposited by wave action on the shore just above the normal high water mark.
Breaker zone	Area in the sea where the waves break.
Coastal squeeze	The reduction in habitat area which can arise if the natural landward migration of a habitat under sea level rise is prevented by the fixing of the high water mark, e.g. a sea wall.
Downdrift	Direction of alongshore movement of beach materials.
Ebb-tide	The falling tide, part of the tidal cycle between high water and the next low water.
Fetch	Length of water over which a given wind has blown that determines the size of the waves produced.
Flood-tide	Rising tide, part of the tidal cycle between low water and the next high water.
Foreshore	Zone between the high water and low water marks, also known as the intertidal zone.
Geomorphology	The branch of physical geography/geology which deals with the form of the Earth, the general configuration of its surface, the distribution of the land, water, etc.
Groyne	Shore protection structure built perpendicular to the shore; designed to trap sediment.
Mean High Water (MHW)	The average of all high waters observed over a sufficiently long period.
Mean Low Water (MLW)	The average of all low waters observed over a sufficiently long period.
Mean Sea Level (MSL)	Average height of the sea surface over a 19-year period.
Offshore zone	Extends from the low water mark to a water depth of about 15 m and is permanently covered with water.
Storm surge	A rise in the sea surface on an open coast, resulting from a storm.
Swell	Waves that have travelled out of the area in which they were generated.
Tidal prism	The volume of water within the estuary between the level of high and low tide, typically taken for mean spring tides.
Tide	Periodic rising and falling of large bodies of water resulting from the gravitational attraction of the moon and sun acting on the rotating earth.
Topography	Configuration of a surface including its relief and the position of its natural and man-made features.
Transgression	The landward movement of the shoreline in response to a rise in relative sea level.
Updrift	Direction opposite to the predominant movement of longshore transport.
Wave direction	Direction from which a wave approaches.
Wave refraction	Process by which the direction of approach of a wave changes as it moves into shallow water.

## Preamble

The Cell 1 Regional Coastal Monitoring Programme covers approximately 300km of the north east coastline, from the Scottish Border (just south of St. Abb's Head) to Flamborough Head in East Yorkshire. This coastline is often referred to as 'Coastal Sediment Cell 1' in England and Wales (Figure 1).



**Figure 1 Sediment Cells in England and Wales**

The main elements of the Cell 1 Regional Coastal Monitoring Programme involve:

- beach profile surveys
- topographic surveys
- cliff top recession surveys
- real-time wave data collection
- bathymetric and sea bed characterisation surveys
- aerial photography
- LiDAR surveys
- walk-over cliff and coastal defence asset surveys

The beach profile surveys, topographic surveys and cliff top recession surveys are undertaken as a 'Full Measures' survey in autumn every year. Some of these surveys are then repeated the following spring as part of a 'Partial Measures' survey.

To date the following reports have been produced:

**Table 1 Analytical, Update and Overview Reports Produced to Date**

Year		Full Measures		Partial Measures		Cell 1 Overview Report
		Survey	Analytical Report	Survey	Update Report	
1	2008/09	Sep-Dec 08	May 09	Mar-May 09	Jun 09	
2	2009/10	Sep-Dec 09	Mar 10	Feb-Mar 10	Jul 10	
3	2010/11	Aug-Nov 10	Feb 11	Feb-Apr 11	Aug 11	Sep 11
4	2011/12	Oct-Nov 11	Oct 12	Mar-May 12	Feb 13	
5	2012/13	Sep-Oct 12	Mar 13	Mar-Apr 13	Jun 13	
6	2013/14	Sep-Oct 13	Feb 14	Mar-Apr 14	Jul 14	
7	2014/15	Oct-Nov 14	Feb 15	Mar 15	Jul 15	
8	2015/16	Oct-Nov 15	Feb 16	Mar 16	Jul 16	Jun 16
9	2016/17	Sep 16	Feb 17	Mar 17	Jul 17	
10	2017/18	Sep-Oct 17	Feb 18	Mar 18	May 18	
11	2018/19	Sep-Oct 18	Jan 19	Feb-Mar 19	Aug 19	
12	2019/20	Sep-Nov 19	Dec 19	Mar 20	Mar 20 (*)	

(\*) The present report is **Update Report 12** and provides an analysis of the 2020 Partial Measures survey for North Tyneside Council's frontage.

## **1. Introduction**

### **1.1 Study Area**

North Tyneside Council's frontage extends from Hartley (just south of Blyth) in the north to River Tyne in the south. For the purposes of this report and for consistency with previous reporting, it has been sub-divided into four areas, namely:

- Whitley Sands
- Cullercoats Bay
- Tynemouth Long Sands
- King Edward's Bay

### **1.2 Methodology**

Along North Tyneside Council's frontage, the following surveying is undertaken:

- Full Measures survey annually each autumn comprising:
  - Beach profile surveys along eight transect lines (commenced 2002)
  - Beach profile surveys along an additional two transects (commenced 2010)
  - Topographic survey along Whitley Sands (commenced 2010)
  - Topographic survey along Tynemouth Long Sands (commenced 2011)
- Partial Measures survey annually each spring comprising:
  - Beach profile surveys along all ten transect lines (commenced 2010)

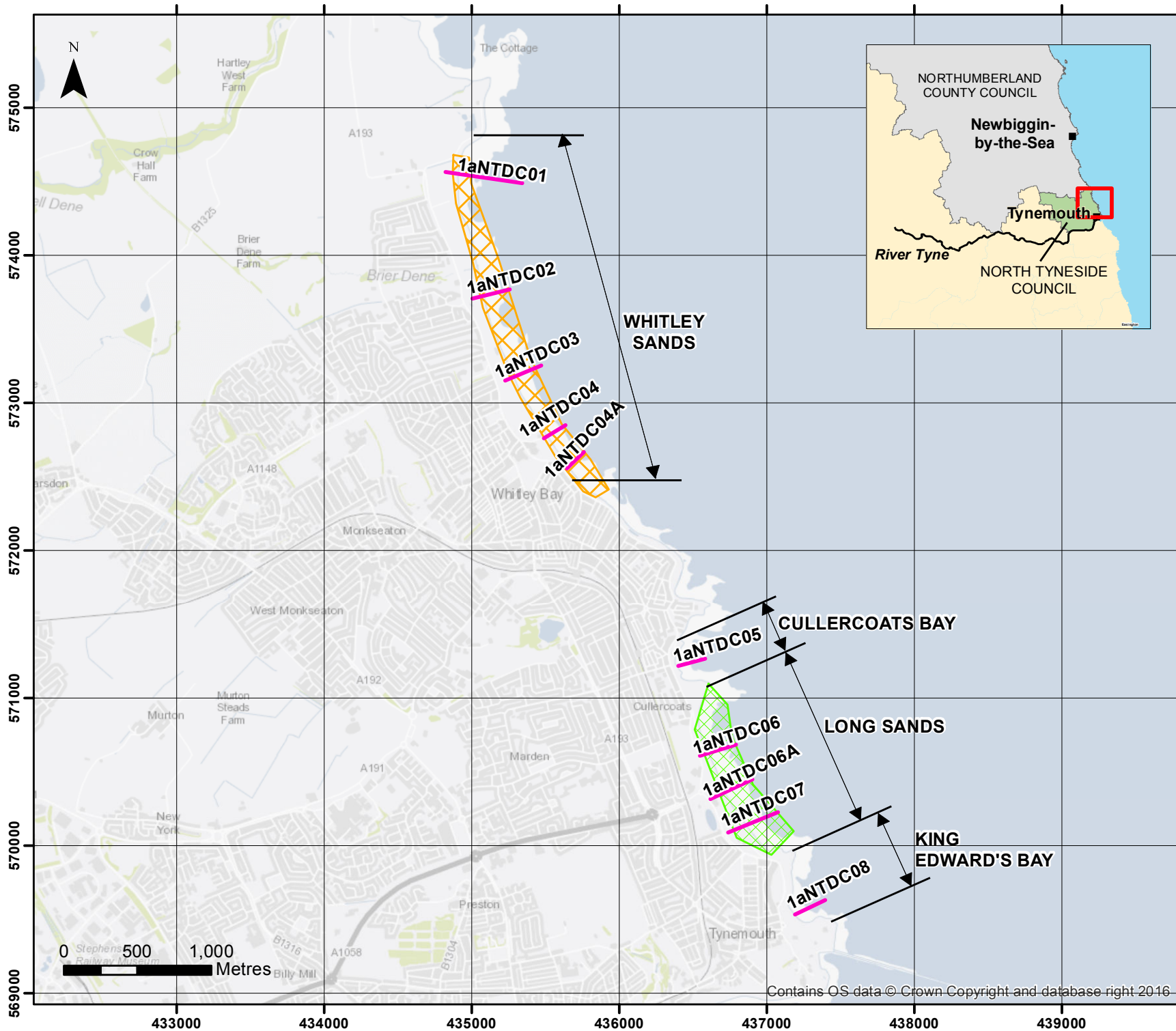
The location of these surveys is shown in Figure 2. The Partial Measures 2020 surveys were undertaken along this frontage on the 9<sup>th</sup>-10<sup>th</sup> March 2020. During this time weather conditions varied; refer to the survey reports for details of the weather conditions over this survey period.

The Update Report presents the following:

- description of the changes observed since the previous survey and an interpretation of the drivers of these changes (Section 2);
- documentation of any problems encountered during surveying or uncertainties inherent in the analysis (Section 3);
- recommendations for 'fine-tuning' the programme to enhance its outputs (Section 4); and
- providing key conclusions and highlighting any areas of concern (Section 5).

Data from the present survey are presented in a processed form in the Appendices.





Key

**SURVEY LOCATIONS**

**Topographic Profiles**

- Annual
- Bi-Annual

**Topographic Surveys**

- 6 monthly
- yearly
- 5 yearly

*(Indicative Survey Extents shown)*

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

**Figure 2 - Map 1**

**North Tyneside Council Frontage**

Analytical Report  
Topo Surveys

Drawing Scale at A4 1:35,000

**WATER**  
Royal HaskoningDHV  
Marlborough House  
Marlborough Crescent  
Newcastle upon Tyne  
NE1 4EE

Tel: +44 (0)191 211 1300  
Fax: +44 (0)191 211 1313  
www.royalhaskoningdhv.com



Contains OS data © Crown Copyright and database right 2016

## 2. Analysis of Survey Data

### 2.1 Whitley Sands

Survey Date	Description of Changes Since Last Survey	Interpretation
<p>9<sup>th</sup> – 10<sup>th</sup> Mar 2020</p>	<p><b>Beach Profiles:</b></p> <p>Whitley Sands is covered by five beach profile lines for the Partial Measures survey (Appendix A). Four of these (1aNTDC01 to 1aNTDC04) were initially surveyed in April 2002 and were then re-surveyed annually to 2009 (Full Measures, autumn 2009) after which time they have been surveyed bi-annually. From March 2010 (Partial Measures, spring 2010) onwards, an additional beach profile line (NTDC04A) has been surveyed at the southern end of the frontage for the same time periods listed above. All profiles were last surveyed in September 2019 for the Full Measures survey.</p> <p><b>1aNTDC01</b> is located in the north of Whitley Sands, along the undefended cliffs immediately south of Trinity Road car park. According to the survey report, the cliff was not measured due to dangerous access. There has been an accretion of up to 0.7m from the toe of the cliff across the upper and middle beach to chainage 110m. Seaward of 110m, the profile shows little change limited to 0.1m. Overall the profile is at a high level on the upper beach and a medium level on the middle and lower beach compared to the range recorded from previous surveys.</p> <p>Profile <b>1aNTDC02</b> is located towards the north of Whitley Sands. From the sea wall to 95m chainage the elevation of the beach has increased by up to 1.0m compared to the previous survey, creating a small berm at chainage 72m. From chainage 95m to the end of the survey the beach levels have decreased by up to 0.8m. The upper beach is at a high level compared to the range recorded from previous surveys, particularly between chainages 49-63m and 66-77m. The middle and lower beach are at a relatively low level compared to the range recorded from previous surveys.</p> <p>Profile <b>1aNTDC03</b> is located at the centre of Whitley Sands. Beach levels have risen between the sea wall and chainage 43m by up to 0.4m. Seawards of chainage 43m the beach level has dropped by up to 0.8m, exposing a rocky outcrop at chainage 75-90m. The toe of the beach has eroded by 0.35m. The upper beach is at a high level compared to the previous surveys, however the middle and lower beach are at a low level.</p>	<p>Since the last survey, beach levels at Whitley Sands have mostly accreted on the upper beach, with erosion dominating across the middle and lower beach.</p> <p><b>Longer term trends:</b></p> <p>The data show that profiles are mostly within the bounds of previous surveys.</p>

Survey Date	Description of Changes Since Last Survey	Interpretation
	<p>Profile <b>1aND04</b> is located to the south of Whitley Sands. There has been erosion between the base of the seawall and chainage 29m by up to 0.2m. The rest of the beach profile alternates between sections of erosion and accretion of <math>\pm 0.5</math>m. A small berm has formed at chainage 40m. Overall the upper beach is at a high level, particularly between chainages 29-45m which is at its highest level recorded since surveys began. The middle and lower beach are at a medium level compared to the range recorded from previous surveys.</p> <p>Profile <b>1aNTDC04a</b> is located to the south of Whitley Sands. A small section of the upper beach has accreted by up to 0.2m to chainage 12m. Seawards of chainage 12m there has been erosion of up to 0.6m, exposing the previously covered rocky shore platform between chainages 72m to 95m. The upper beach is relatively high level compared to the range recorded from previous surveys whilst the middle and lower beach are at a medium-low level.</p>	

## 2.2 Cullercoats Bay

Survey Date	Description of Changes Since Last Survey	Interpretation
<p>9<sup>th</sup> – 10<sup>th</sup> Mar 2020</p>	<p><b>Beach Profiles:</b></p> <p>Cullercoats Bay is covered by one beach profile line for the Partial Measures survey (Appendix A). This was surveyed annually each autumn between 2002 and 2009. From spring 2010 onwards, it has been surveyed bi-annually. The last survey was the September 2019 Full Measures survey.</p> <p>The cliff top position along <b>1aNTDC05</b> has remained constant since surveys began in April 2002. According to the survey report, the cliff was not measured due to dangerous access. There has been accretion from the foot of the cliff at chainage 25m to 52m by up to 0.5m. Between chainage 52m and 91m there has been erosion of 0.4m, flattening the middle beach. Seaward of chainage 91m, there has been a negligible change of <math>\pm 0.2</math>m. Overall the beach is at a medium level on the upper beach to medium-high level on the middle and lower beach compared to the range recorded from previous surveys.</p>	<p>There has been a flattening of the middle beach to create a smoother profile.</p> <p><b>Longer term trends:</b> The beach levels observed are within the bounds of previous surveys, indicating generic behaviour with no clear trend.</p>

## 2.3 Tynemouth Long Sands

Survey Date	Description of Changes Since Last Survey	Interpretation
<p>9<sup>th</sup> – 10<sup>th</sup> Mar 2020</p>	<p><b>Beach Profiles:</b></p> <p>Tynemouth Long Sands is covered by three beach profile lines for the Partial Measures survey (Appendix A). Profiles 1aNTDC06 and 1aNTDC07 were initially surveyed annually each autumn between 2002 and 2009. A third profile, 1aNTDC06A, was later added in the centre of the frontage. From spring 2010 (Partial Measures) onwards, they have been surveyed bi-annually. The last survey was the September 2019 Full Measures survey.</p> <p><b>1aNTDC06</b> is located approximately 150m south of the access road/ramp towards the north of the bay. The profile for the dune-cliff face is limited due to a lack of data points in the profile plot; the survey report for this monitoring period and previous survey reports have noted ‘<i>no access to middle of section 6 due to seed protection fences</i>’. There has been erosion from the toe of the dune-cliff to chainage 79m by up to 0.5m. Between chainages 79m and 125m there has been a small amount of accretion of up to 0.2m. Between chainages 125m and 155m there has been negligible change limited to <math>\pm 0.1</math>m. Seawards of chainage 155m there has been accretion of up to 0.2m. Overall the profile is at a medium level compared to the range recorded from previous surveys.</p> <p>At profile <b>1aNTDC06A</b>, the profile for the dune-cliff face is a straight line; a result of a lack of data points in the profile plot; the survey report for this monitoring period and previous survey reports have noted ‘<i>no access to middle of section 6A due to seed protection fences</i>’. There has been limited change across the upper and middle beach profile, up to <math>\pm 0.2</math>m. Overall the profile is at medium level compared to the range recorded from previous surveys.</p> <p>Profile <b>1aNTDC07</b> is located approximately 50m south of the access route through the dunes towards the southern end of the bay. As with the other profiles the dune-cliff face is a straight line; a result of a lack of data points in the profile plot. The survey report for this monitoring period and earlier reports note ‘<i>no access to middle of section 7 due to seed protection fences</i>’. The beach has seen very little change of <math>\pm 0.2</math>m from the toe of the dunes to the end of the profile. Overall the beach is at a relatively high level compared to the range recorded from previous surveys, particularly between chainages 85-11m which is at its highest recorded level.</p>	<p>At Tynemouth Long Sands, the dune-cliff face was not surveyed due to access constraints, but survey photographs suggest that wind-blown sand continues to accrete in the lee of the defences.</p> <p>Beach profile change has been relatively small over the winter/spring months and generally showing erosion of berms and creation of smoother concave profiles.</p> <p><b>Longer term trends:</b> Overall, the beaches have retained a similar form and are within the bounds of previous surveys.</p>

Survey Date	Description of Changes Since Last Survey	Interpretation
<p><b>9<sup>th</sup> March 2020</b></p>	<p><b>Topographic Survey:</b></p> <p>The first survey for Tynemouth Long Sands was undertaken for the Full Measures survey in October 2010.</p> <p>Data from the current topographic survey have been used to create a digital ground model (DGM) (Appendix B – Map 1) using a Geographical Information System (GIS). A difference plot has also been produced by comparing the current DGM (Appendix B – Map 2) with that produced from the last topographic survey (November 2019).</p> <p>The difference plot shows that accretion dominated the upper and middle beach of the northern half of the bay, whilst erosion has dominated on the lower beach. In the central and southern areas of the bay, there are small patches of erosion on the middle and lower beach, with a band of accretion across the upper beach. Overall, change is limited to <math>\pm 0.75\text{m}</math>.</p>	<p>Since the last survey, the beach at Tynemouth Long Sands has been dominated by accretion in the north and central part of the bay, with isolated patches of erosion occurring across the bay.</p>

## 2.4 King Edward's Bay

Survey Date	Description of Changes Since Last Survey	Interpretation
<p>9<sup>th</sup> – 10<sup>th</sup> Mar 2020</p>	<p><b>Beach Profiles:</b></p> <p>King Edward's Bay is covered by one beach profile line for the Full Measures survey (Appendix A). This was surveyed annually each autumn between 2002 and 2009. From spring 2010 onwards, it has been surveyed bi-annually. The last survey was the September 2019 Full Measures survey.</p> <p>At profile <b>1aNTDC08</b> there has been movement of the upper beach berm further seaward by 6m. Seaward of chainage 98m there has been erosion of up to 0.2m. The beach toe has shortened by 64m. The upper beach is at a high level and the middle and lower beach are at a medium level compared to the range recorded from previous surveys.</p>	<p>Since the last survey, the beach at King Edward's Bay beach has seen little change, except the movement of an upper beach berm seaward by 6m.</p> <p><b>Longer term trends:</b> Changes recorded across the beach since the last survey are within the range of historical beach levels.</p>

### **3. Problems Encountered and Uncertainty Analysis**

#### **Individual Profiles**

- At profile 1aNTDC01 the cliff was not measured due to dangerous access.
- At profile 1aNTDC05 the cliff was not measured due to dangerous access. Access to this profile is noted to have been dangerous in the previous Partial Measures and Full Measures reports, and it is therefore recommended that the beach profile data should start at the cliff toe and the cliff position should be monitored from aerial survey data.
- At Tynemouth Long Sands (profiles 1aNTDC06, 1aNTDC06A and 1aNTDC07) there was no access to the dunes in the middle of the profile due to seedling protection fences. This means it has not been possible to directly monitor the effectiveness of the dune stabilisation scheme, although observations have been made from the survey photographs.

#### **Topographic Survey**

- N/A

### **4. Recommendations for 'Fine-tuning' the Monitoring Programme**

It is recommended that access to the stabilised dunes at Tynemouth Long Sands be attempted in future surveys in order to monitor the effectiveness of the stabilisation fences.

### **5. Conclusions and Areas of Concern**

- At Whitley Sands, beach levels have generally increased on the upper beach across the bay, with erosion on the middle and lower beach. For the most part, the upper beach is at a high level across the bay, whilst middle to lower beach levels across the bay were at a medium-low levels. Beach levels should continue to be monitored in the next survey to check for signs of recovery or further erosion.
- At Cullercoats Bay, at profile 1aNTDC05, there has been a flattening of the middle beach to create a smoother profile, but there are no causes for concern.
- At Tynemouth Long Sands, the dune-cliff face was not surveyed due to access constraints, and beach profile change has been relatively small generally showing erosion of berms and the creation of smoother concave profiles. The topographic survey is dominated by accretion in the upper and middle beach of the north of the bay, with small isolated patches of erosion on the lower beach in the north and across the beach in the south. Overall the beach is at a medium level compared to the range recorded from previous surveys, however profile 1aNTDC07 is at a relatively high level compared to the range recorded from previous surveys, particularly between chainages 85-11m which is at its highest recorded level. There are no causes for concern.
- At King Edward's Bay, the upper beach berm has moved seaward by 6m, with change across the rest of the beach limited to  $\pm 0.2$ m. There are no causes for concern.



## **Appendices**

**Appendix A**  
**Beach Profiles**

The following sediment feature codes are used on some profile plots:

<b>Code</b>	<b>Description</b>
S	Sand
M	Mud
G	Gravel
GS	Gravel & Sand
MS	Mud & Sand
B	Boulders
R	Rock
SD	Sea Defence
SM	Saltmarsh
W	Water Body
GM	Gravel & Mud
GR	Grass
D	Dune (non-vegetated)
DV	Dune (vegetated)
F	Forested
X	Mixture
FB	Obstruction
CT	Cliff Top
CE	Cliff Edge
CF	Cliff Face
SH	Shell
ZZ	Unknown

# Beach Profile

Location: 1aNTDC01

Date: 10/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

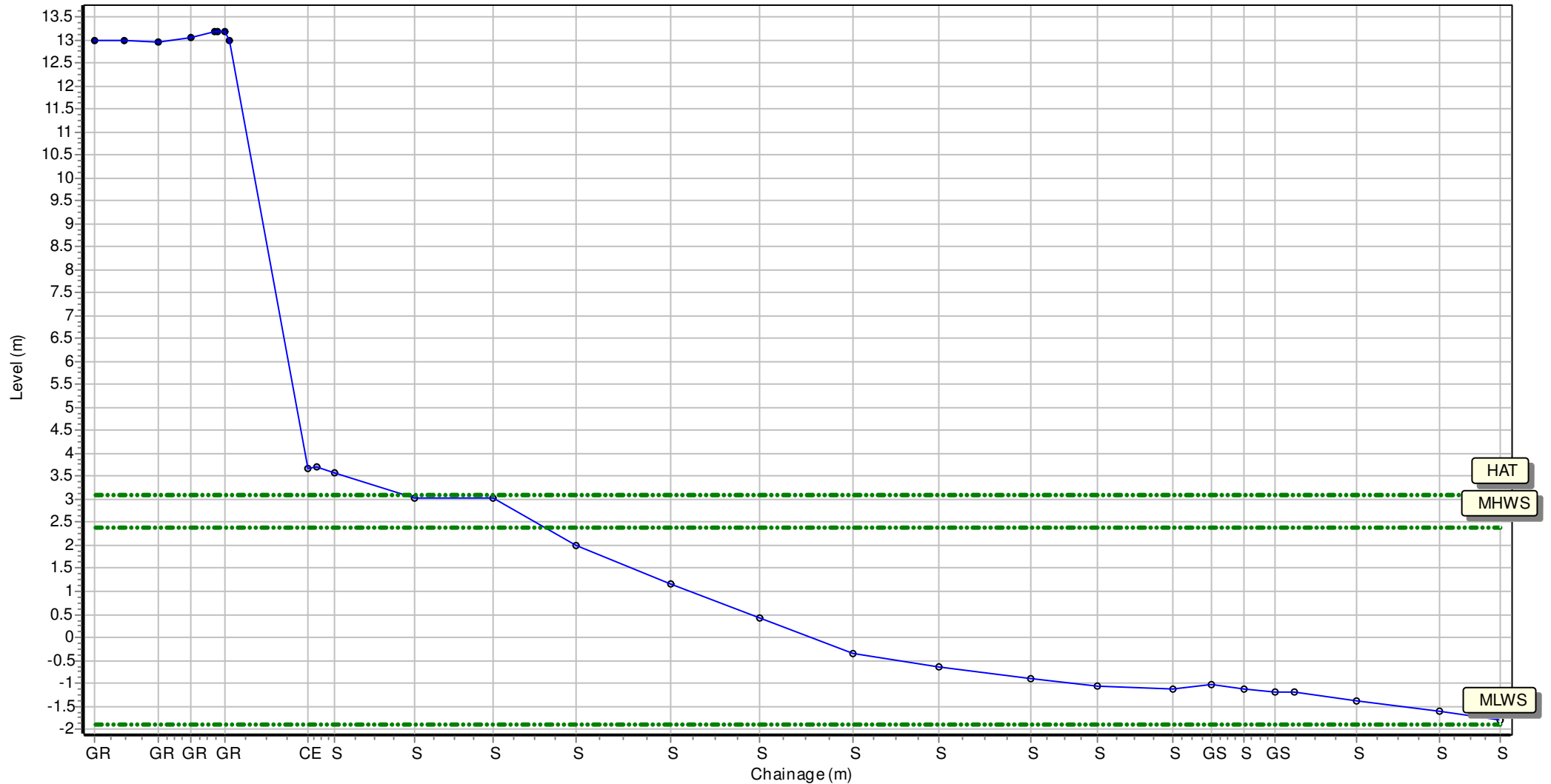
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 434851.079 Northing: 574565.379 Profile Bearing: 99 ° from North



# Beach Profile

Location: 1aNTDC02

Date: 10/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

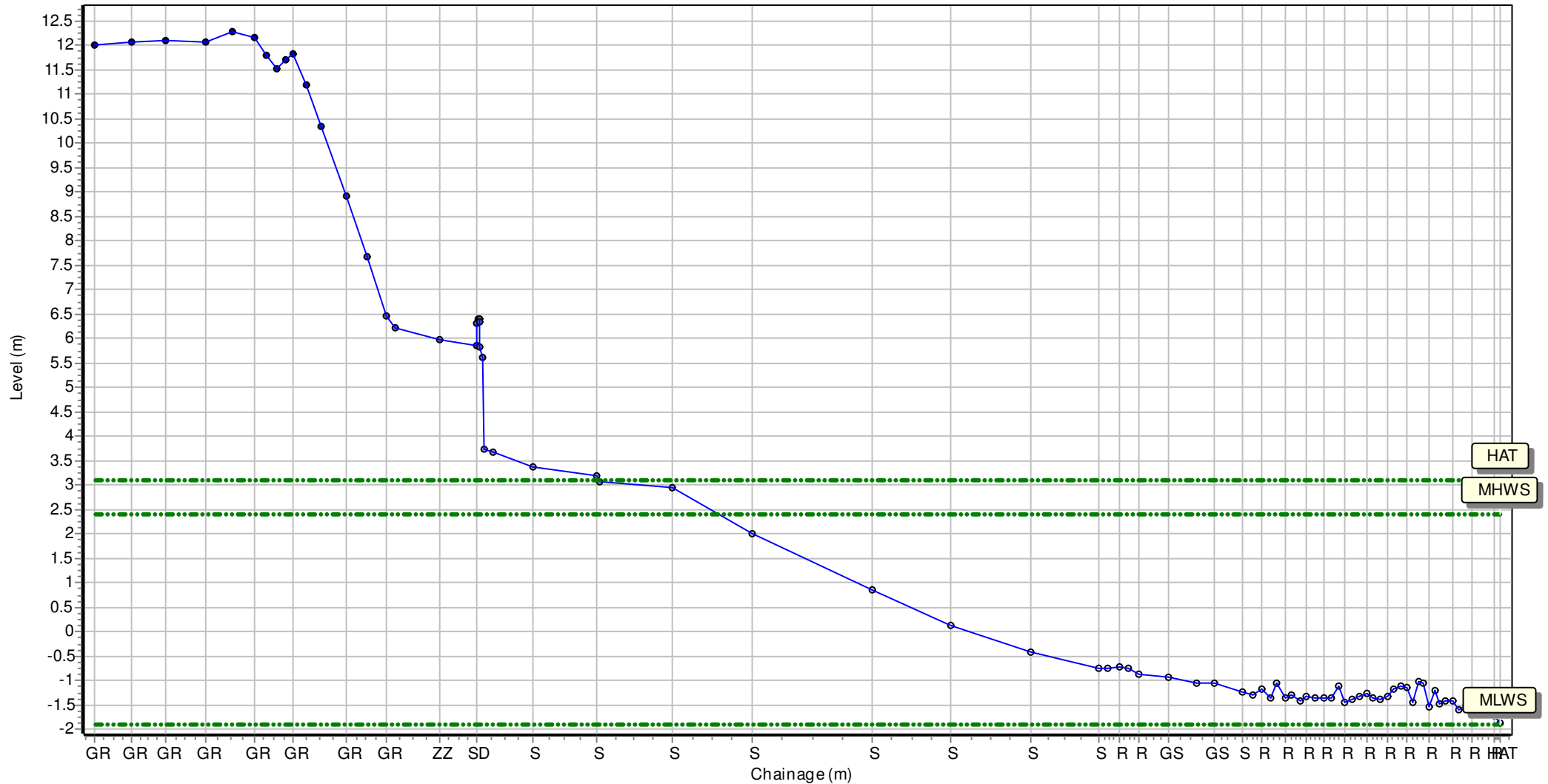
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 435030.395 Northing: 573704.317 Profile Bearing: 76 ° from North



# Beach Profile

Location: 1aNTDC03

Date: 10/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

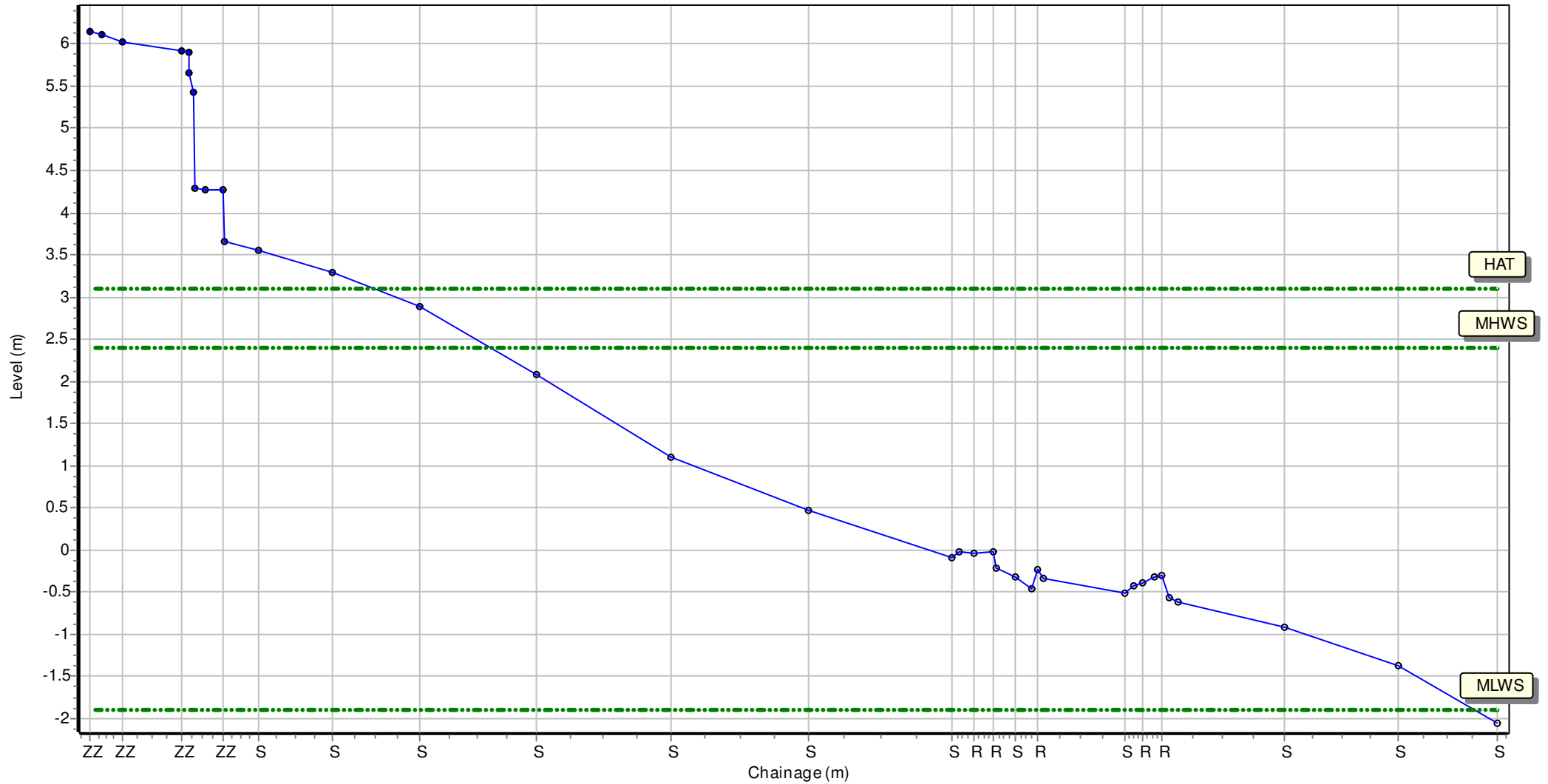
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 435270.865 Northing: 573151.795 Profile Bearing: 70 ° from North



# Beach Profile

Location: 1aNTDC04

Date: 10/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

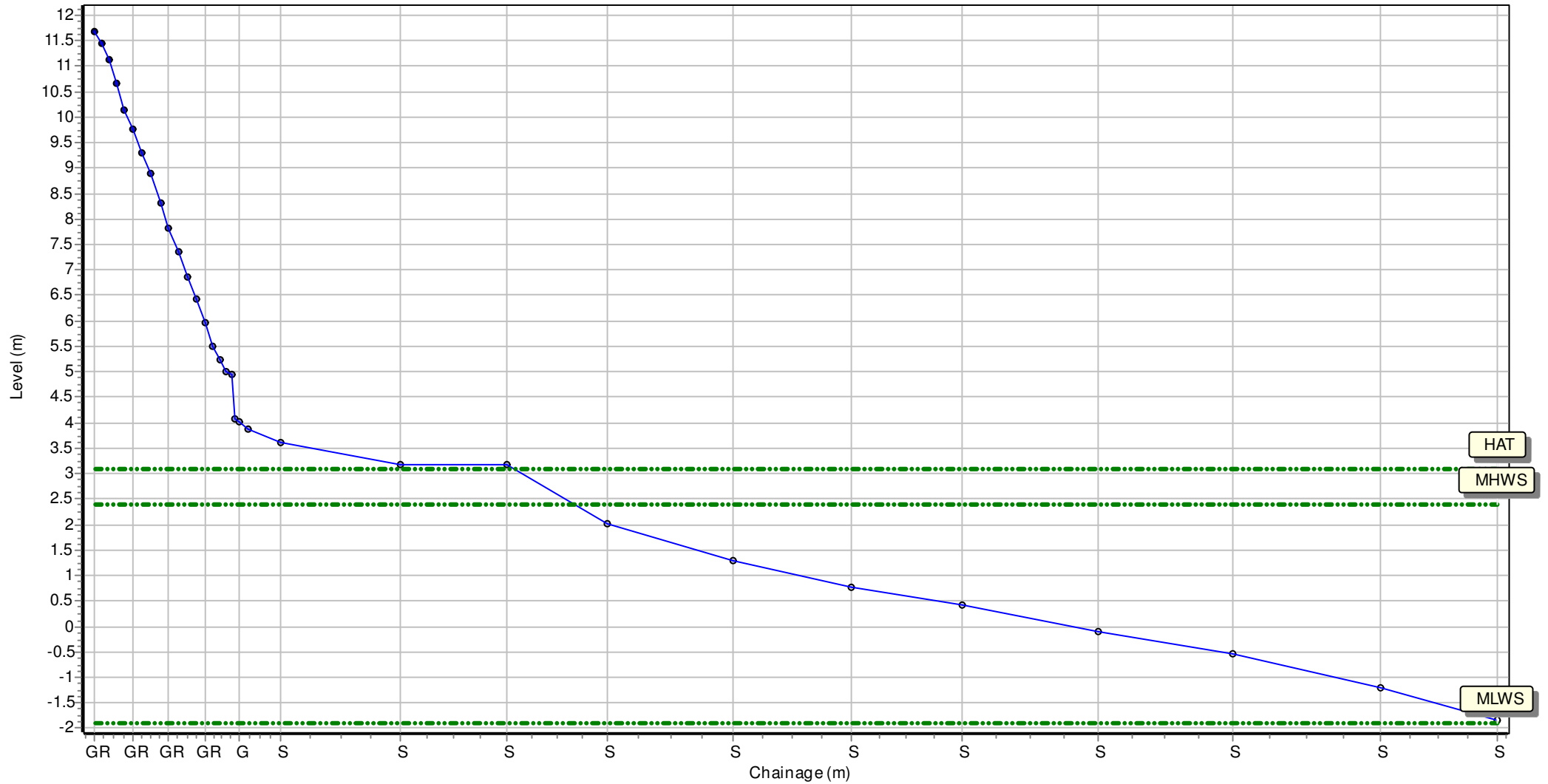
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 435490.594 Northing: 572746.234 Profile Bearing: 60 ° from North



# Beach Profile

Location: 1aNTDC04A

Date: 10/03/2020 Inspector: AG

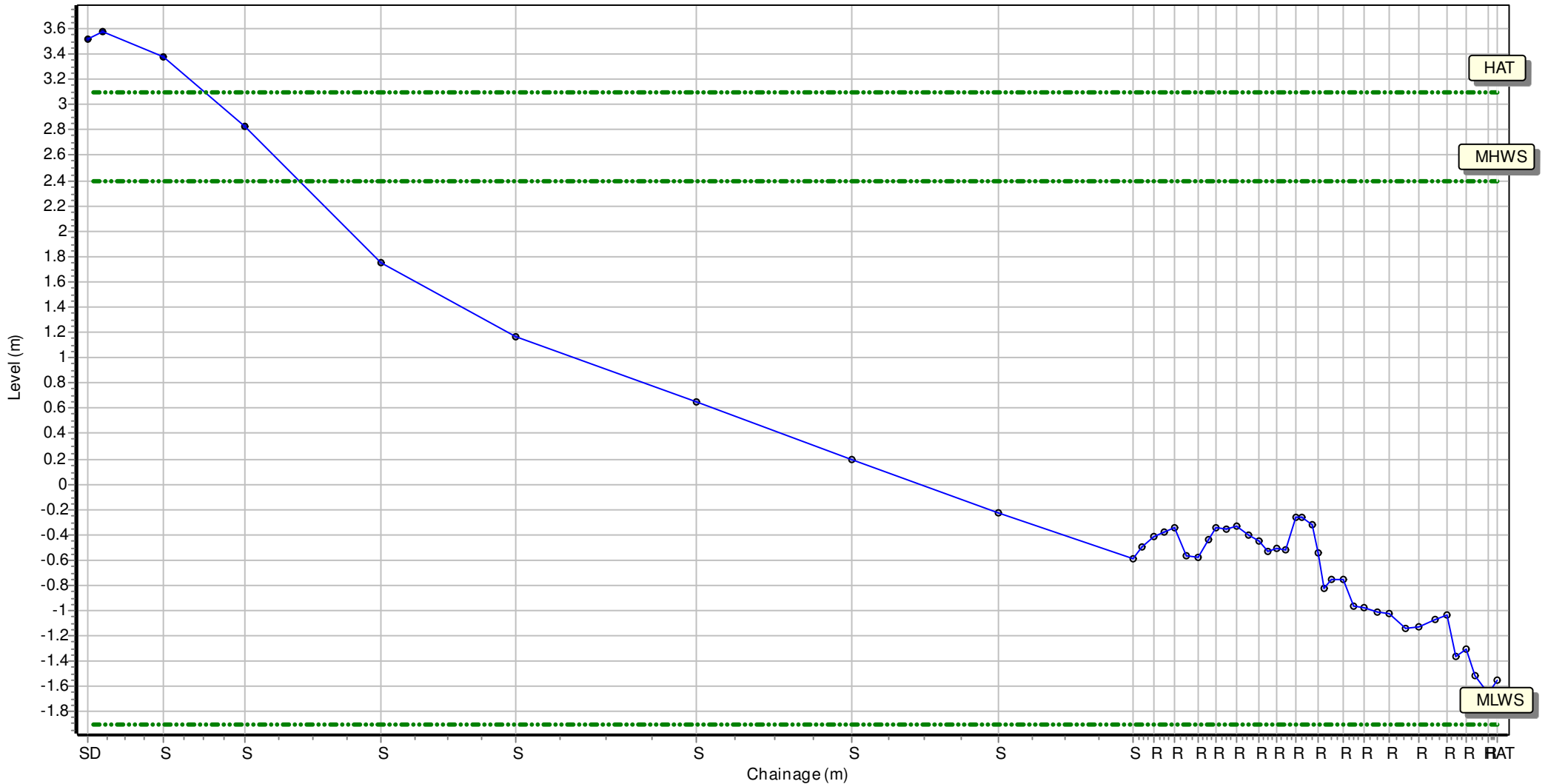
Low Tide: Low Tide Time:

Wind Sea State:

Visibility: Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 435645.554 Northing: 572557.615 Profile Bearing: 46 ° from North





# Beach Profile

Location: 1aNTDC05

Date: 09/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

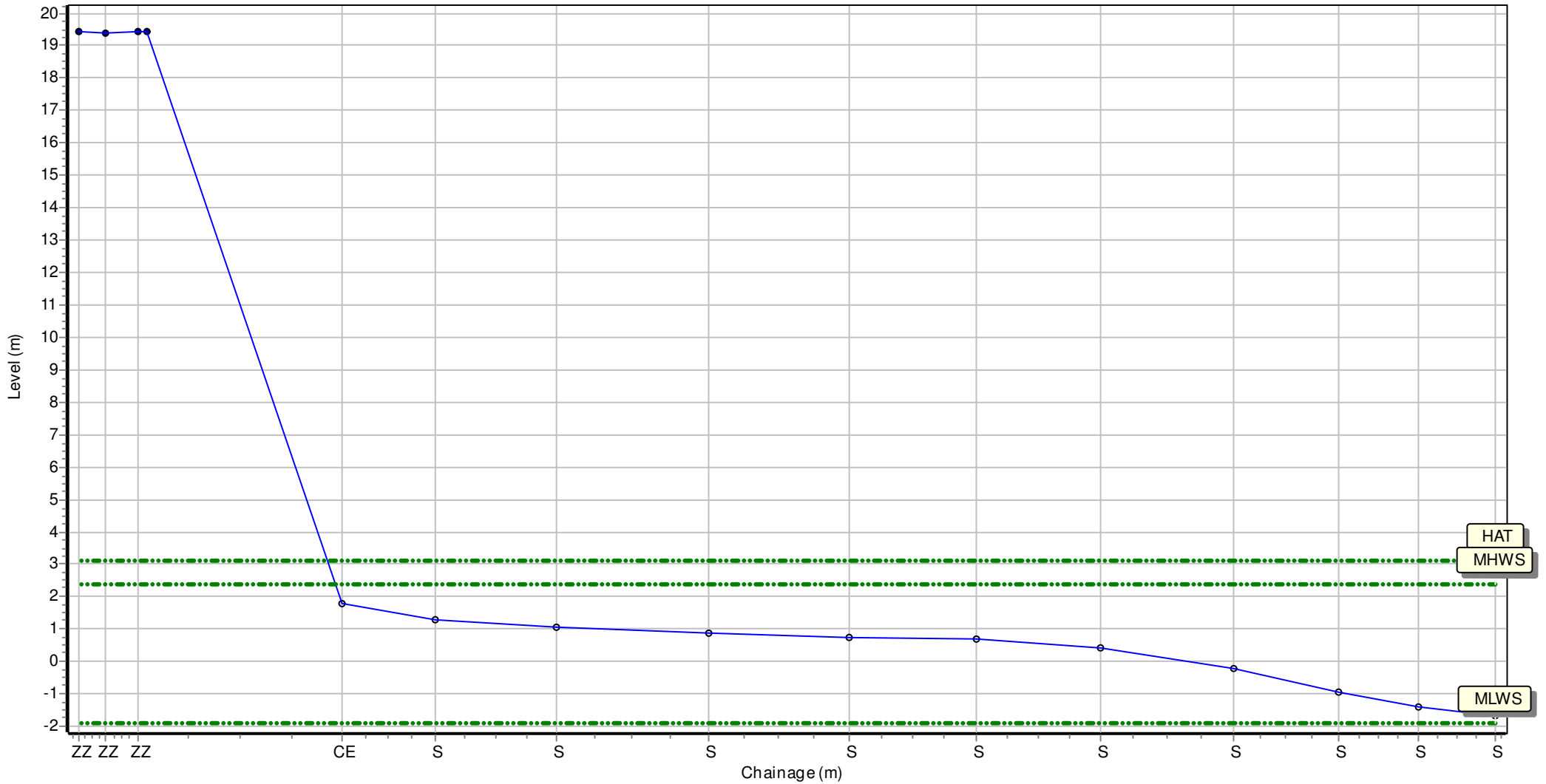
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 436365.005 Northing: 571217.518 Profile Bearing: 77 ° from North



# Beach Profile

Location: 1aNTDC06

Date: 09/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

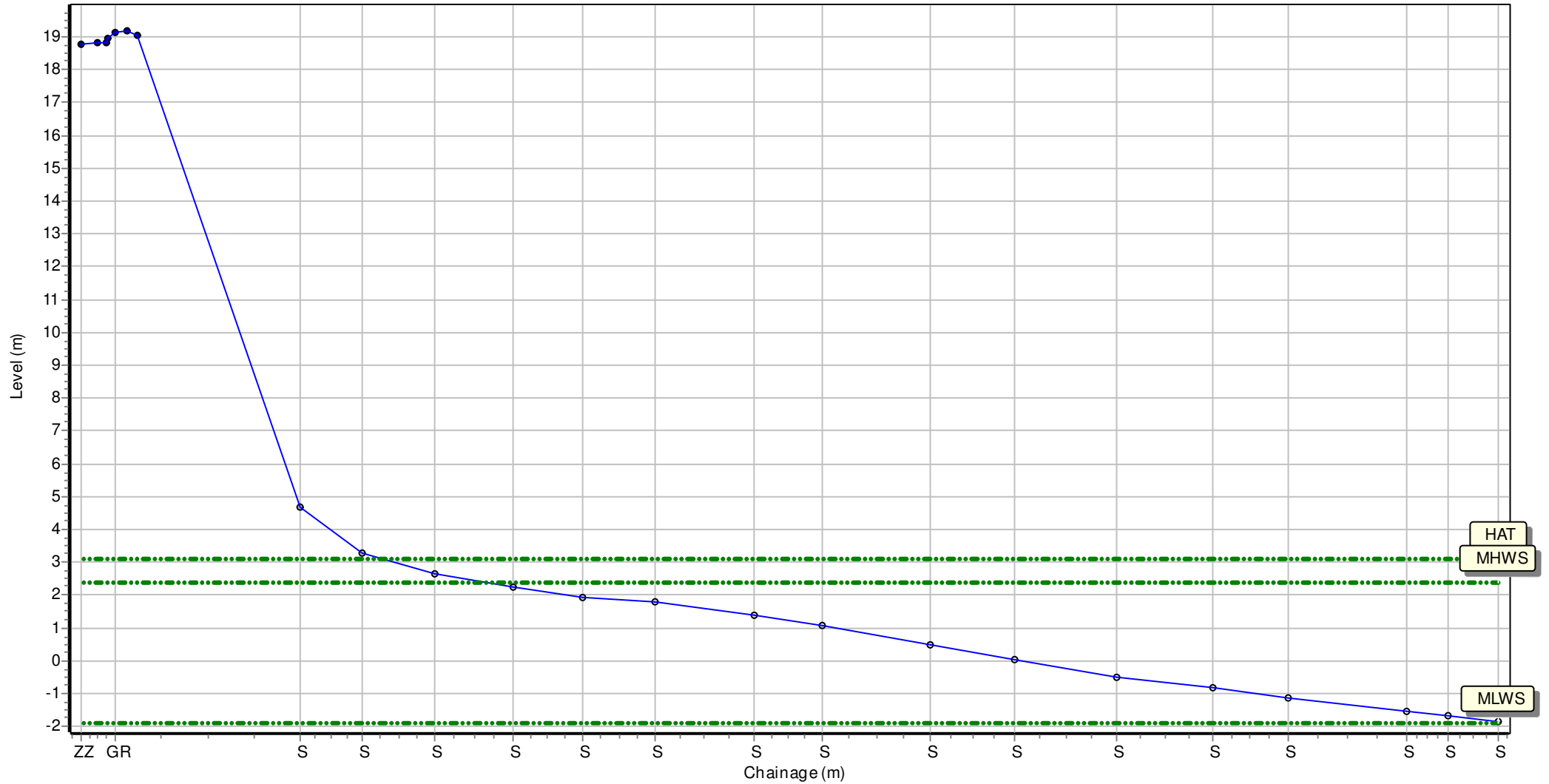
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 436550.6 Northing: 570613.529 Profile Bearing: 77 ° from North



# Beach Profile

Location: 1aNTDC06A

Date: 09/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

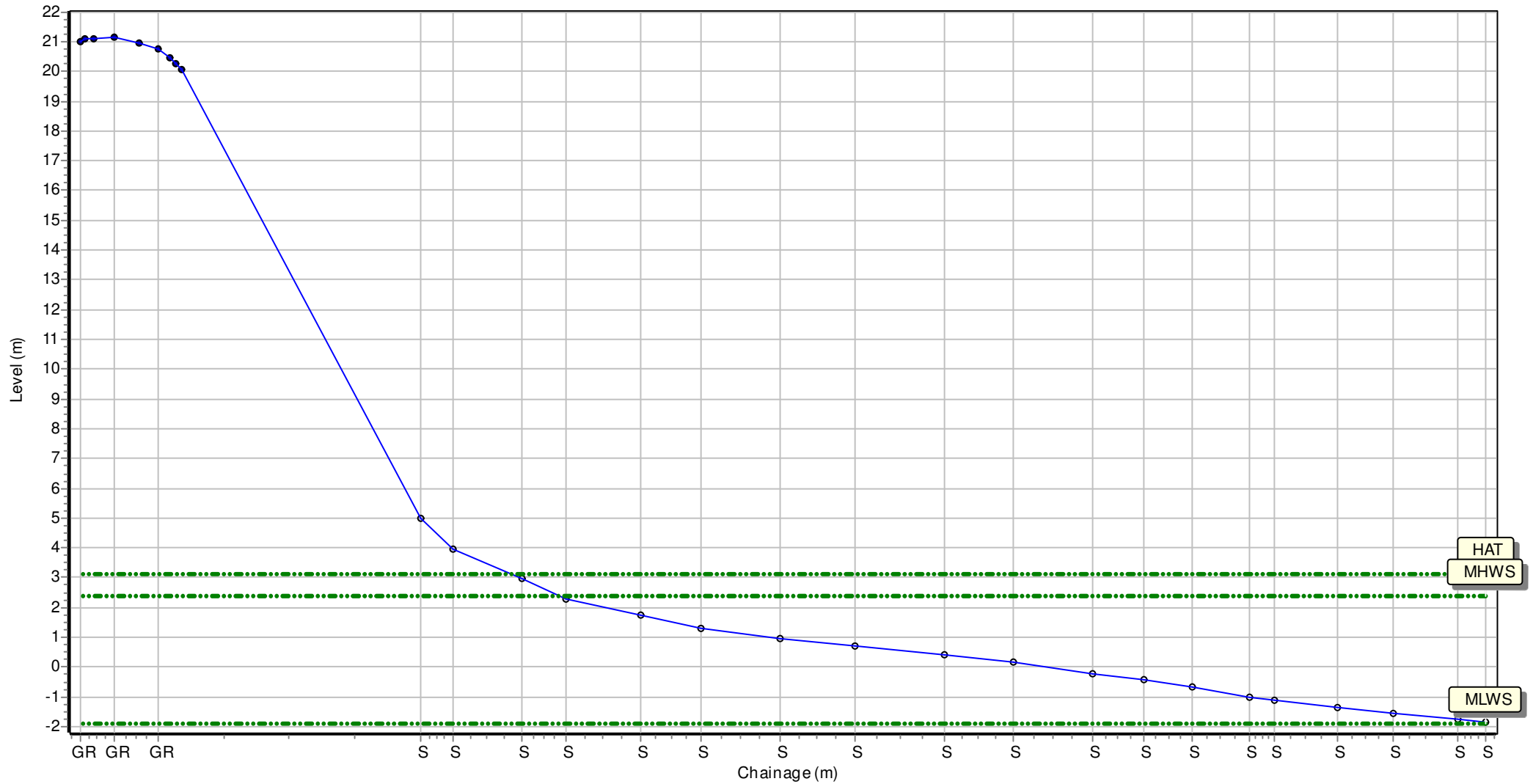
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 436620.512 Northing: 570317.533 Profile Bearing: 65 ° from North



# Beach Profile

Location: 1aNTDC07

Date: 09/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

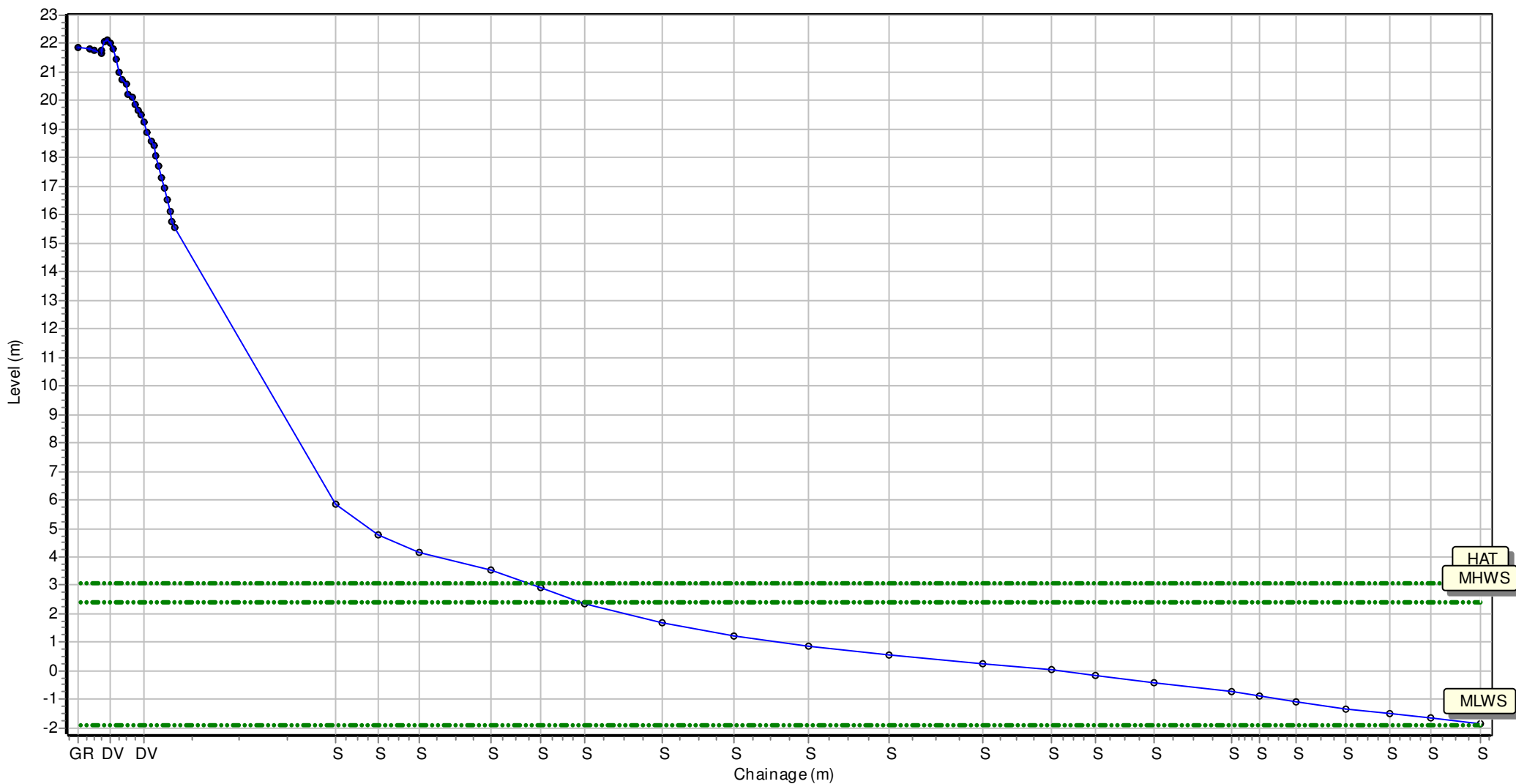
Sea State:

Visibility:

Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 436742.221 Northing: 570082.97 Profile Bearing: 74 ° from North



# Beach Profile

Location: 1aNTDC08

Date: 09/03/2020

Inspector: AG

Low Tide:

Low Tide Time:

Wind

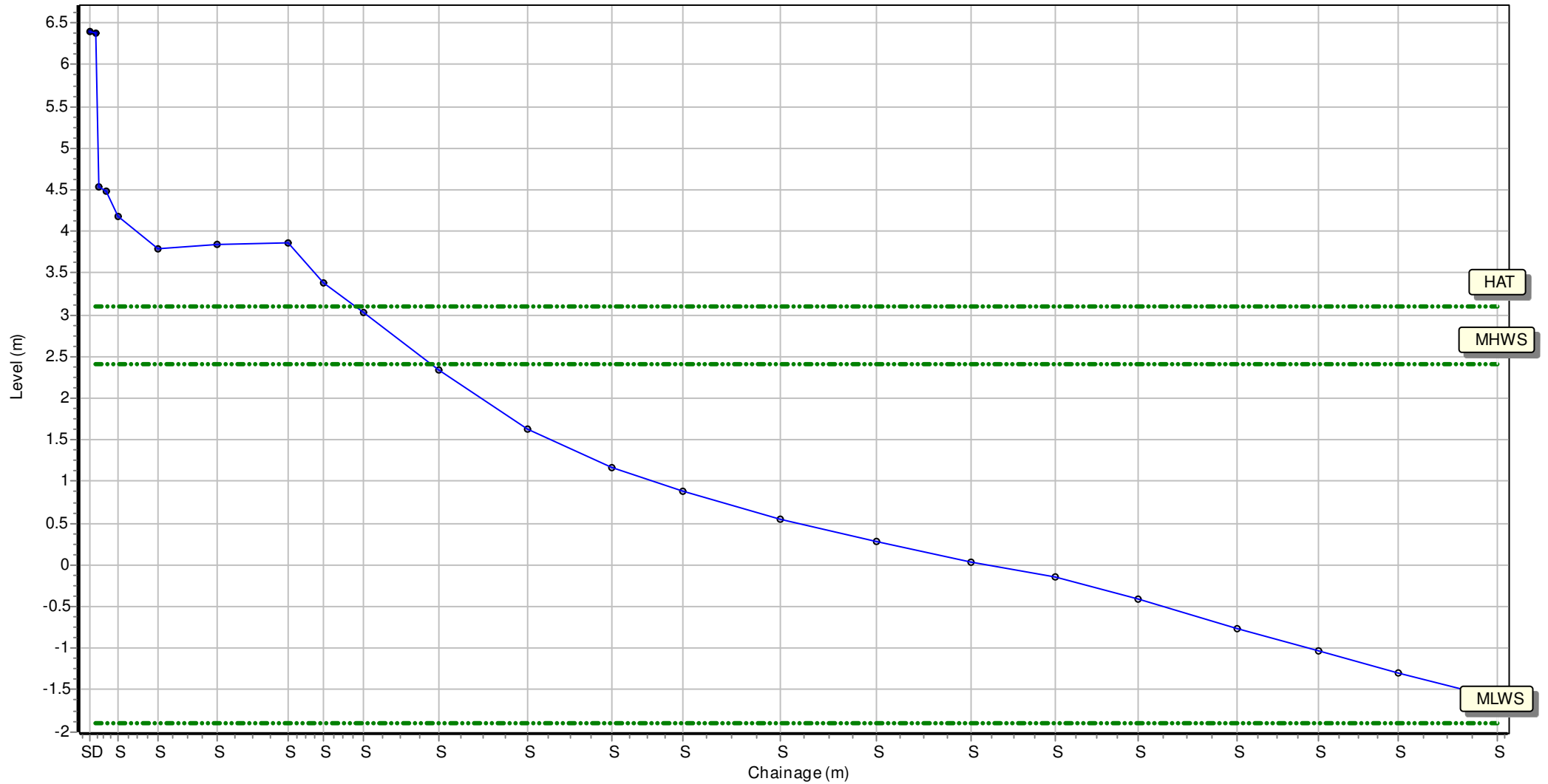
Sea State:

Visibility:

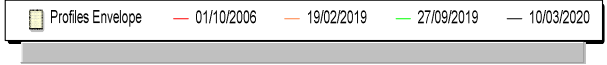
Rain:

Summary: 2020 Partial Measures Topo Survey

Easting: 437142.187 Northing: 569510.828 Profile Bearing: 67 ° from North



# Beach Profiles: 1aNTDC01



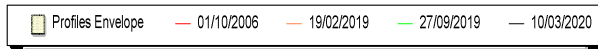
HAT

MHWS

MLWS

SANDS

Beach Profiles: 1aNTDC02



HAT

MHWS

MLWS

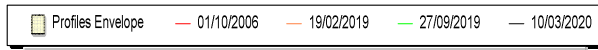
SANDS

Beach Profiles: 1aNTDC03





# Beach Profiles: 1aNTDC04



HAT

MHWS

MLWS

SANDS

Beach Profiles: 1aNTDC04A



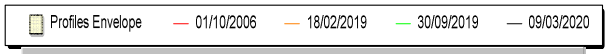
HAT

MHWS

MLWS

SANDS

# Beach Profiles: 1aNTDC05



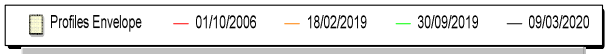
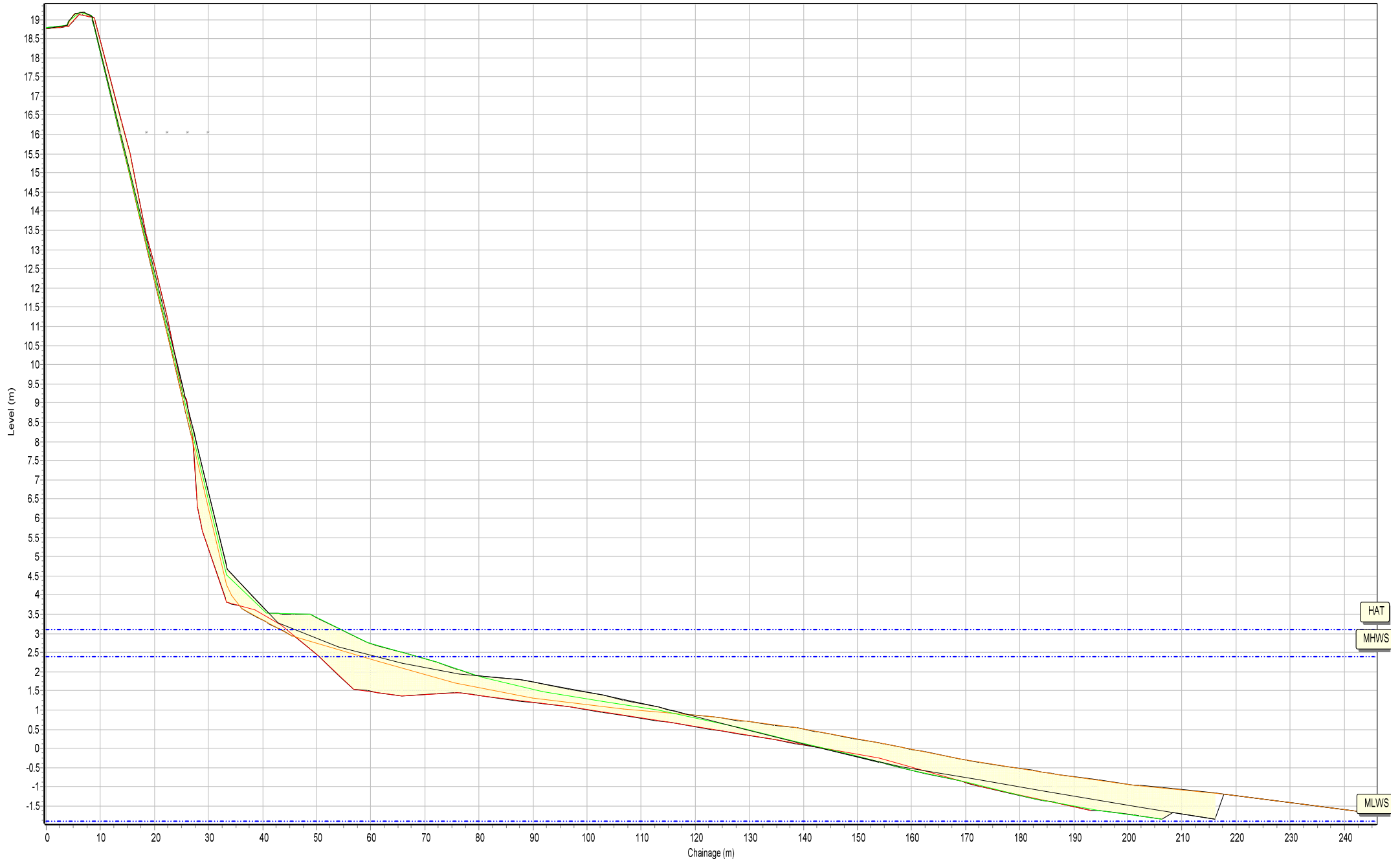
HAT

MHWS

MLWS

SANDS

Beach Profiles: 1aNTDC06



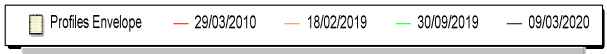
HAT

MHWS

MLWS

SANDS

Beach Profiles: 1aNTDC06A



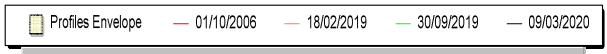
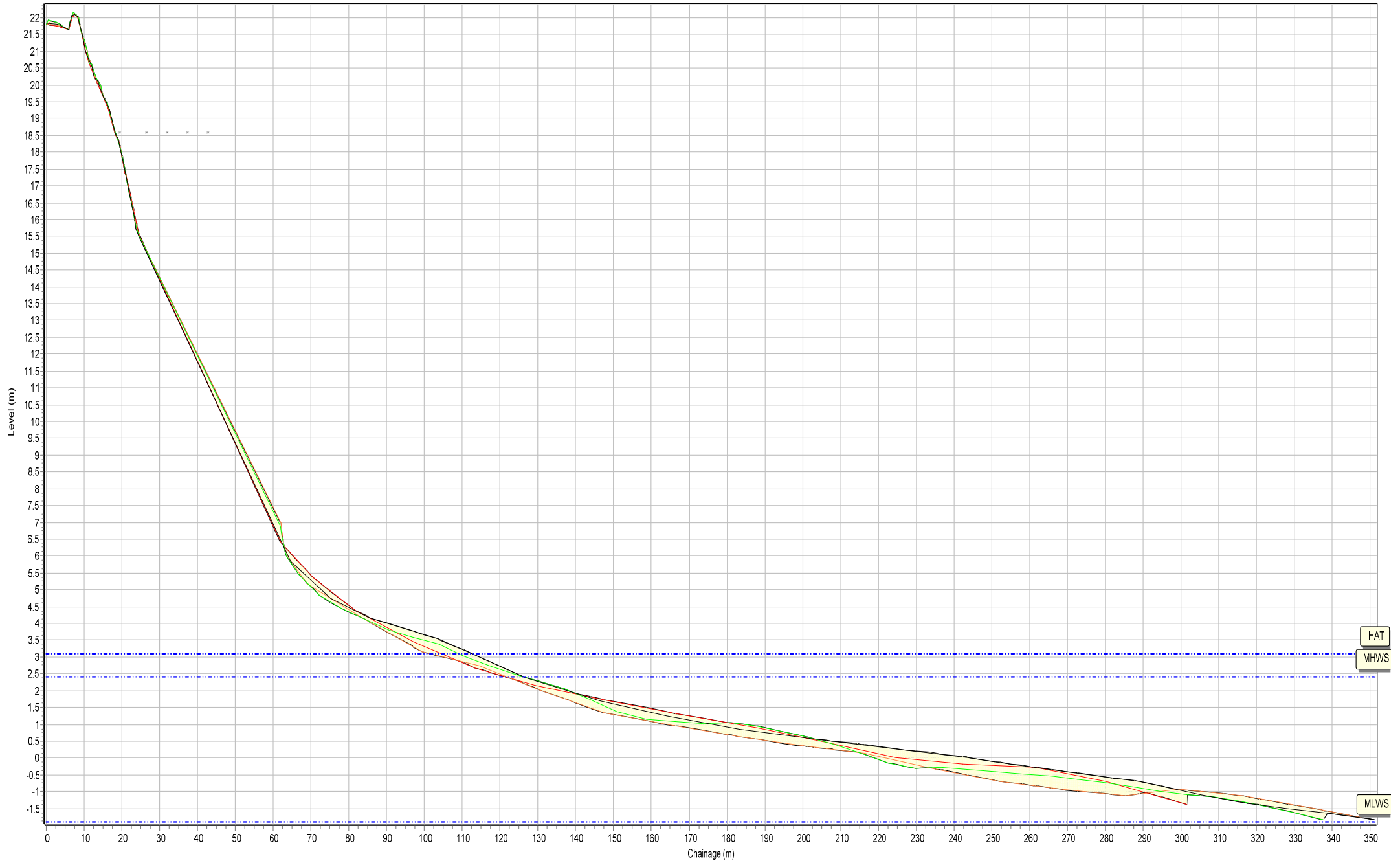
HAT

MHWS

MLWS

SANDS

Beach Profiles: 1aNTDC07



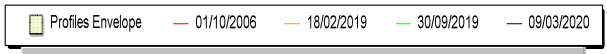
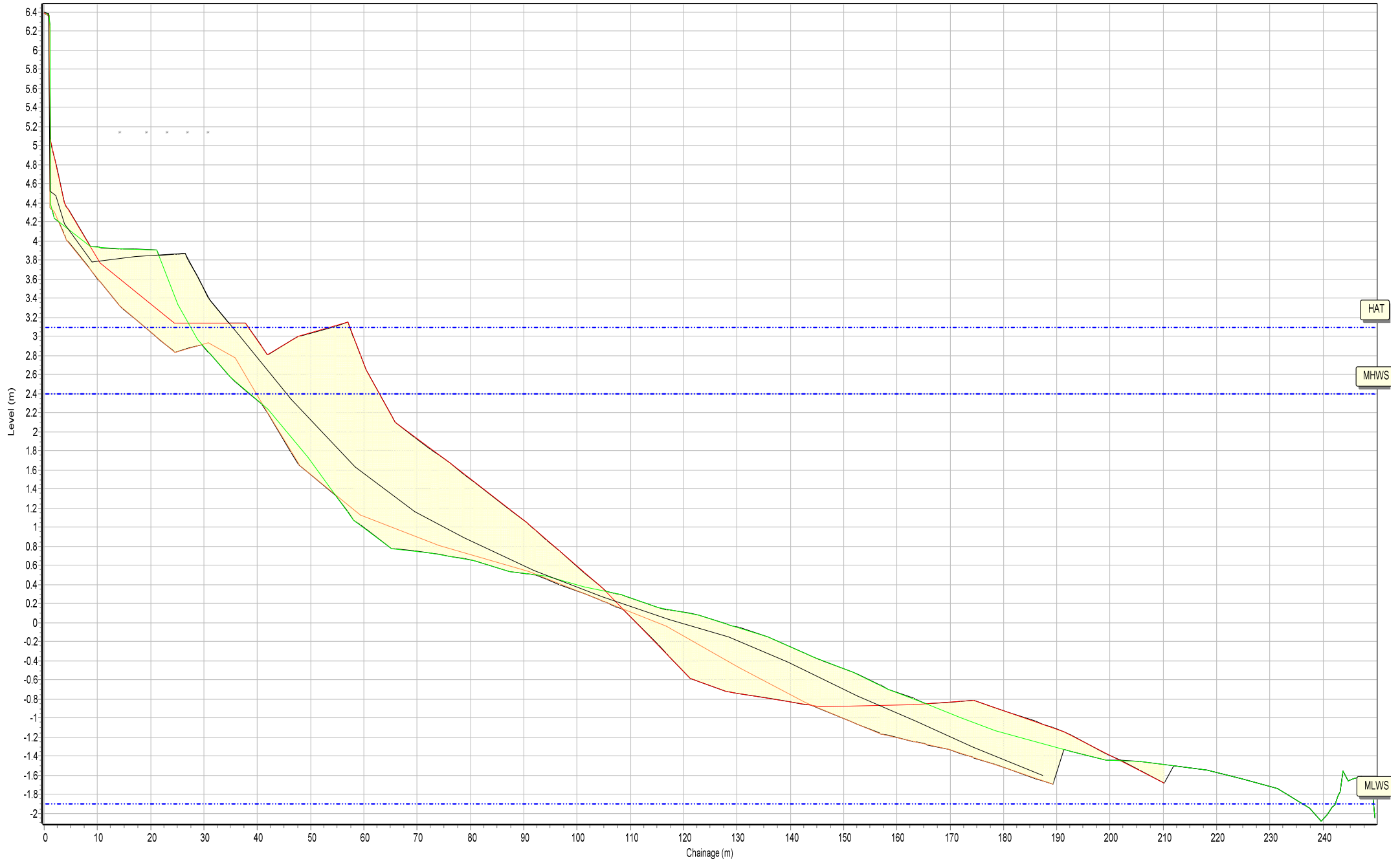
HAT

MHWS

MLWS

SANDS

Beach Profiles: 1aNTDC08



HAT

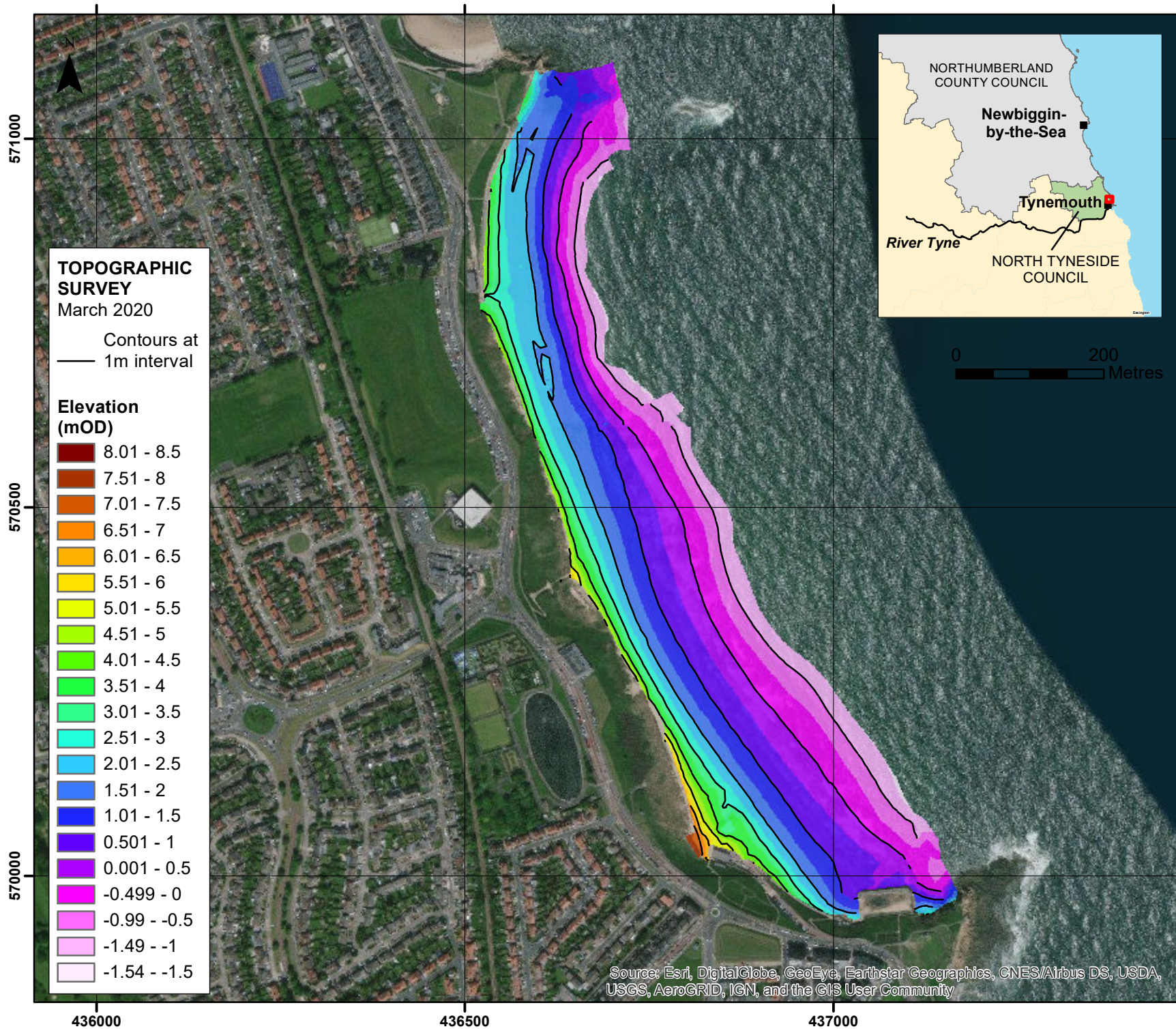
MHWS

MLWS

SANDS

**Appendix B**  
**Topographic Survey**





Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

**Appendix B - Map 1**

**LONGSANDS**

**North Tyneside Council Frontage**

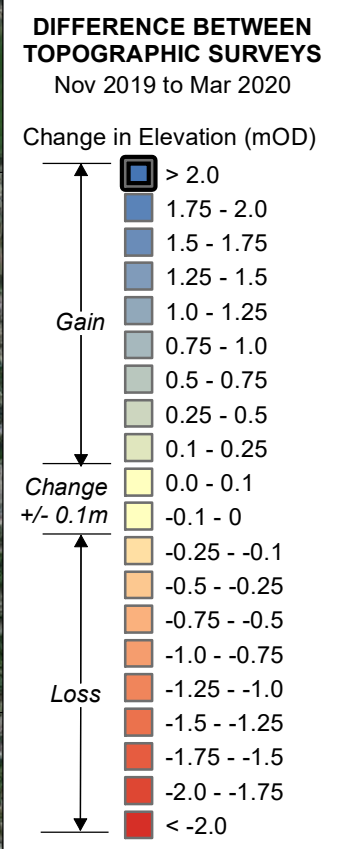
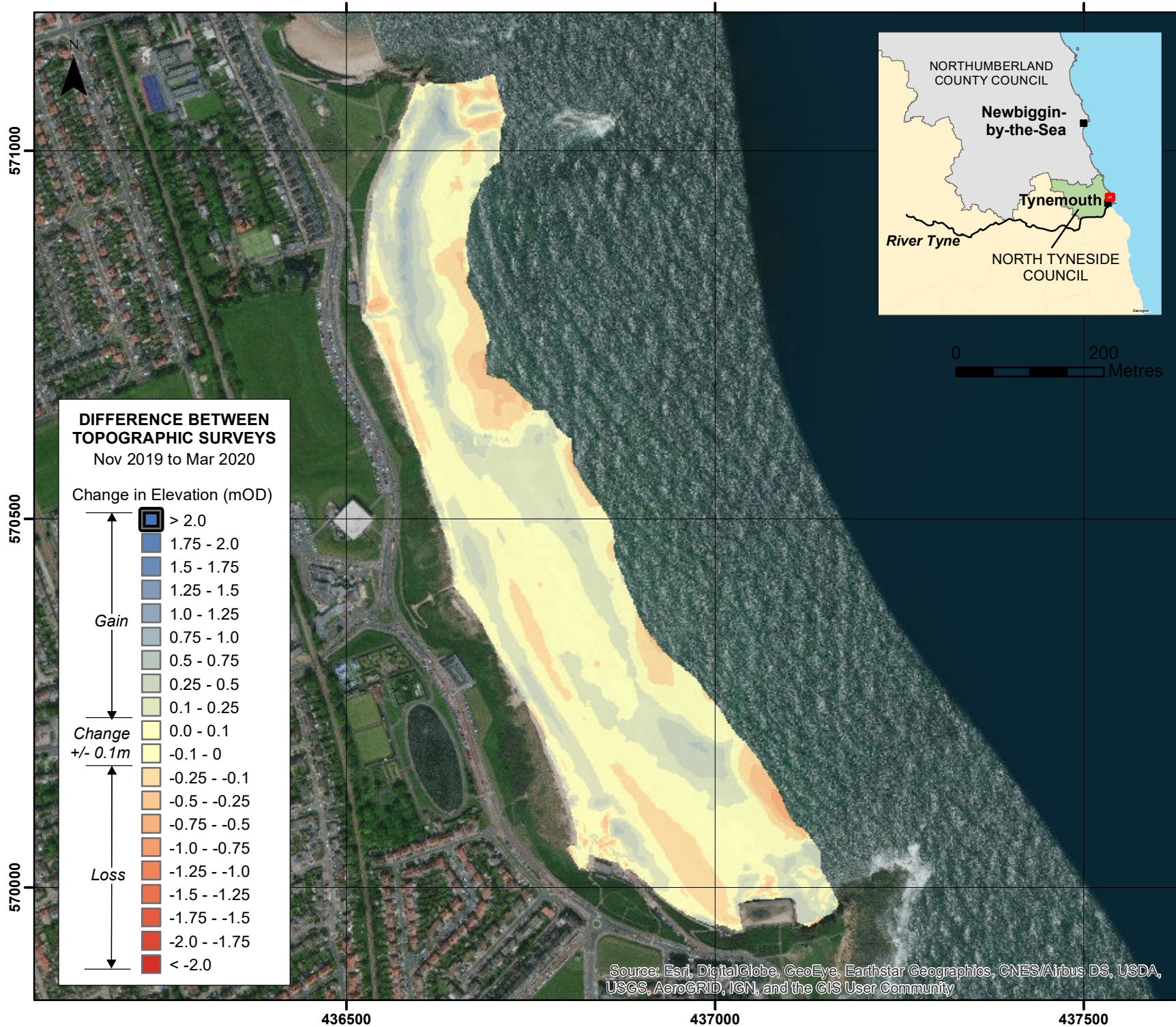
Update Report  
'Partial Measures' Survey 2020

Drawing Scale at A4 1:7,000

**WATER**  
Royal HaskoningDHV  
Marlborough House  
Marlborough Crescent  
Newcastle upon Tyne  
NE1 4EE

Tel: +44 (0)191 211 1300  
Fax: +44 (0)191 211 1313  
www.royalhaskoningdhv.com





Client: North East Coastal Group  
Project: Cell 1 Regional Coastal Monitoring Programme

**Appendix B - Map 2**  
**LONGSANDS**  
**North Tyneside Council Frontage**  
Update Report  
'Partial Measures' Survey 2020

Drawing Scale at A4 1:7,000

**WATER**  
Royal HaskoningDHV  
Marlborough House  
Marlborough Crescent  
Newcastle upon Tyne  
NE1 4EE

Tel: +44 (0)191 211 1300  
Fax: +44 (0)191 211 1313  
www.royalhaskoningdhv.com



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community