SABRINA SEA FLOOR SURVEY

(IN2017-V01)

PISTON CORE IMAGES, VISUAL LOGS AND GRAIN SIZE DATA SUMMARIES

IN2017-V01-A005-PC01

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Introduction

This document presents images, colour description, colour analysis profiles and summary grain size data for individual core sections from piston core IN2017-V01-A005-PC01 collected during the Sabrina Sea Floor Survey on the *RV Investigator* between January and March 2017. Detail of the survey can be obtained in the post-survey report (Armand et al., 2018).

Core Details

The core was collected with the RV Investigator piston corer.

Core Number: IN2017-V01-A005-PC01

Locations: Longitude 115.623 Latitude -64.471 (WGS84)

Water depth: 2163 m

Length: 1338 m

Section Labelling

IN2017-V01 piston cores are labelled by number and letter with the bottom section labelled number 01 as it comes from the core barrel. Letter A is given to the top section with letters in descending alphabetic order. Depths are given in centimeters (Table 1).

Core section	Top Depth (cm)	Bottom Depth (cm)
14A	0	49
13B	49	143
12C	143	244
11D	244	344
10E	344	445
09F	445	542
08G	542	644
07H	644	745
06I	745	842
05J	842	942
04K	942	1042
03L	1042	1137
02M	1131	1238
01N	1238	1338

Core processing

Cores were split and described at the Geoscience Australia core repository. Initial descriptions included structure, texture and Munsell colour of the cut and scraped surface. Photos were taken using a hand held digital camera at the time of description but high resolution optical scans were obtained using the camera of the Avaatech XRF Scanner at the Research School of Earth Sciences, ANU.

Image Processing and analysis

Image adjustments, enhancement and analysis were conducted using the ImageJ-Fiji software package version 1.52n which is a public domain image processing package (Schindelin et al., 2012). Image files, both tiff and jpeg, from the Avaatech scanner were adjusted using the IMAGE>ADJUST>BRIGHTNESS & CONTRAST facility to achieve images close to the Munsell Colours logged when the cores were split. The best results were obtained by reducing the Maximum brightness from 255 to 70. This was applied to all cores and resulting files saved separately, retaining the original scan files.

Sediment "brightness" was measured using the ANALYZE>PLOT PROFILE facility. A rectangle was drawn for the length of each core that minimised the number of cracks, holes and other artefacts influencing the result. Then a plot of Pixel Intensity against core depth was produced for each core.

Miguez-Sala et al. (2019) describe several contrast-enhancing methods that can be used in the study of trace fossils in cores. We chose to use the Contrast Limited Adaptive Histogram Equalisation (CLAHE) on each core image. CLAHE produces local histograms for redistributing lightness values for different parts of the image. The Contrast Limiting reduces the amplification of noise for uniform parts of the image. CLAHE was chosen because it could be used uniformly and easily for all images. Further step used by Miguez-Sala et al. (2019) were not applied. The effects of CLAHE were to enhance some colour changes and boundaries within cores while changing the colours from the original. CLAHE was applied using ImageJ-Fiji PROCESS>ENHANCE CONTRAST with Equalising Histograms turned on and Saturated Pixels set at 0.3%.

Adjusted images, CLAHE images and Pixel Intensity graphs are plotted against depth for all cores.

Grain Size

Grain size information was obtained using a Malvern Laser Grain Size analyser in the laboratories of Geoscience Australia. Samples were taken at 10 cm intervals. Data are presented as bar graphs showing Clay-Silt-Sand for each sample.

Presentation

All data and images were loaded into Strater 3 software and plotted against depth for each core section.

References

Miguez-Sala, O., Dorador, J. and Rodríguez-Tovar, J., 2019. Introducing Fiji and ICY image processing techniques in ichnological research as tool for sedimentary analysis. Marine Geology, 413, 1-9.

Schindelin, J., Arganda-Carreras, I., Frise, E., Kaynig, V., Longair, M., Pietzsch, T., Preibisch, S., Rueden, C., Saalfeld, S., Schmid, B., Tinevez, J-Y., White, D.J., Hartenstein, V., Eliceiri, K.,

Tomancak., P. and Cardona, A., 2012. Fiji: an open-source platform for biological-image analysis. Nature Methods, 9 (7), 676-682.

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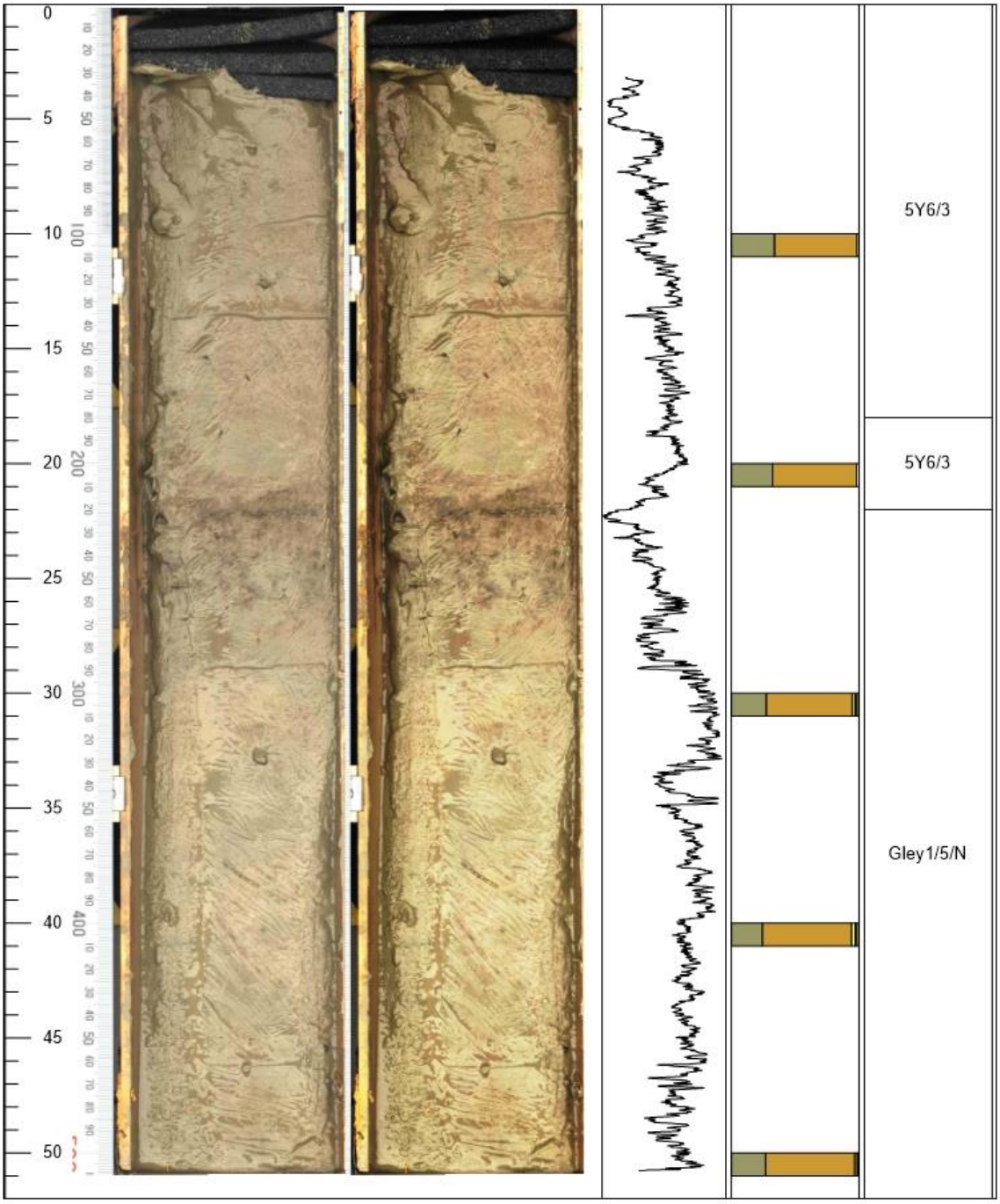
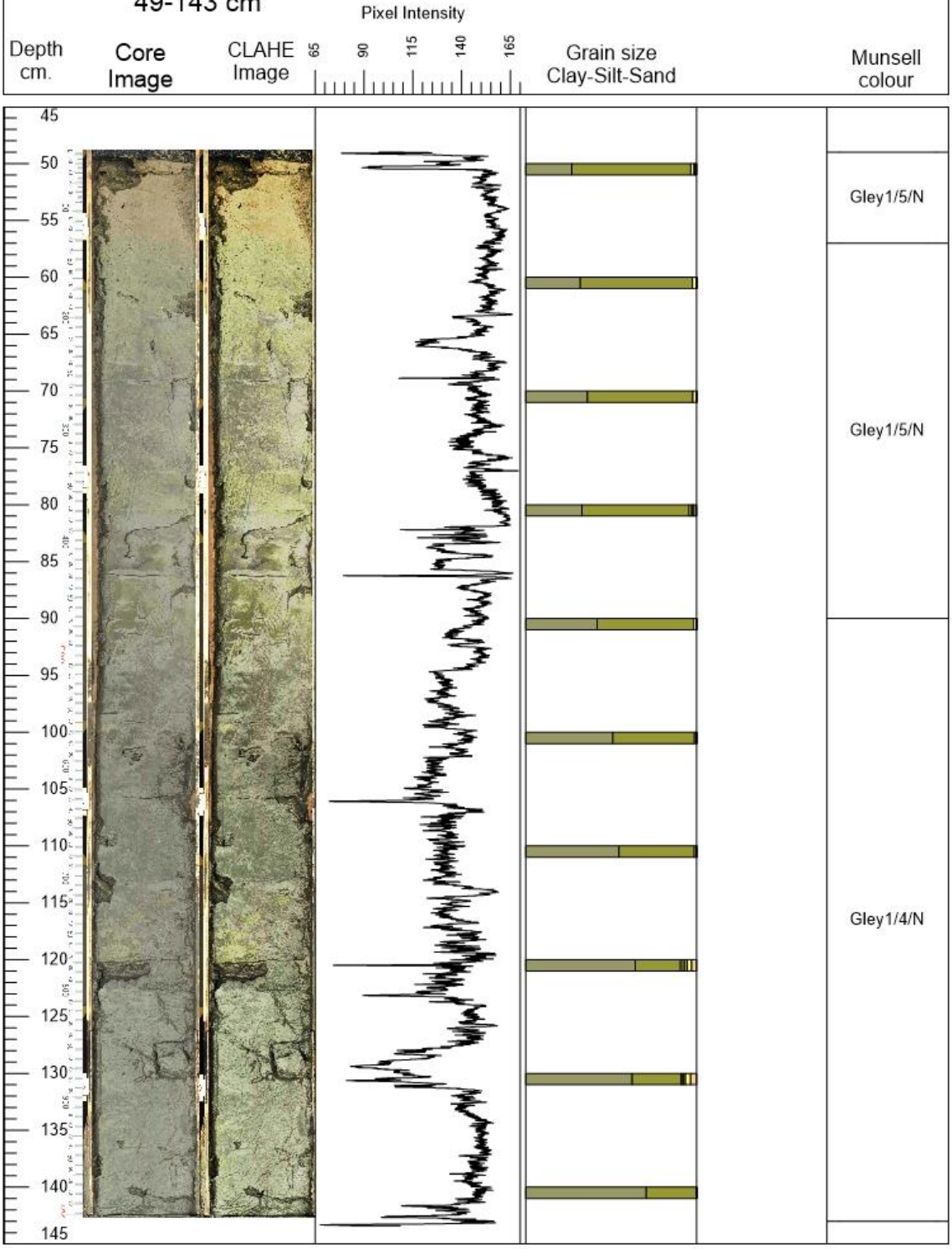
Grain size analyses were carried out by Aziah Williamson at Geoscience Australia. Alix Post publishes with permission of the CEO, Geoscience Australia under creative commons.

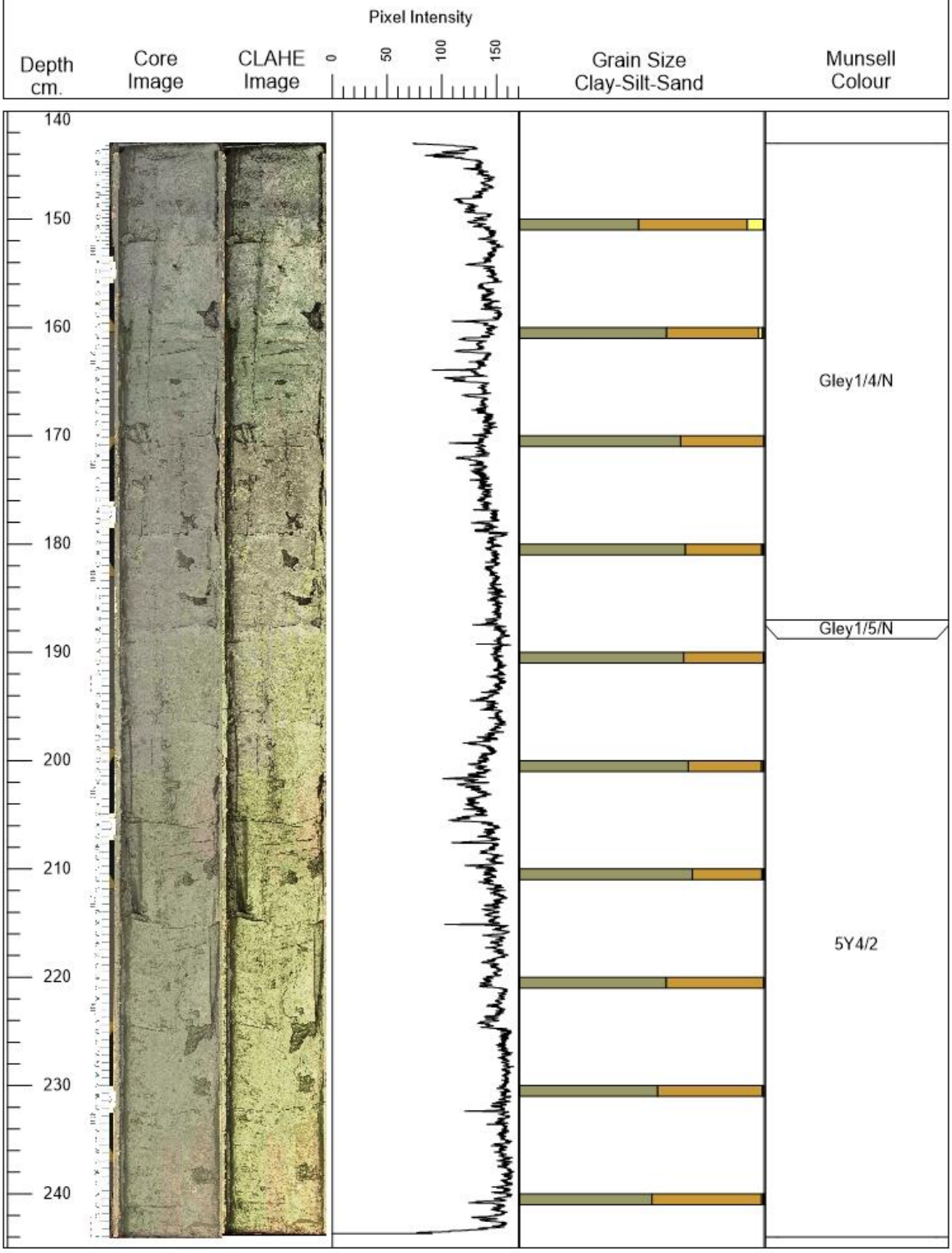
IN2017-V01-A005-PC01-14A
0-49 cm



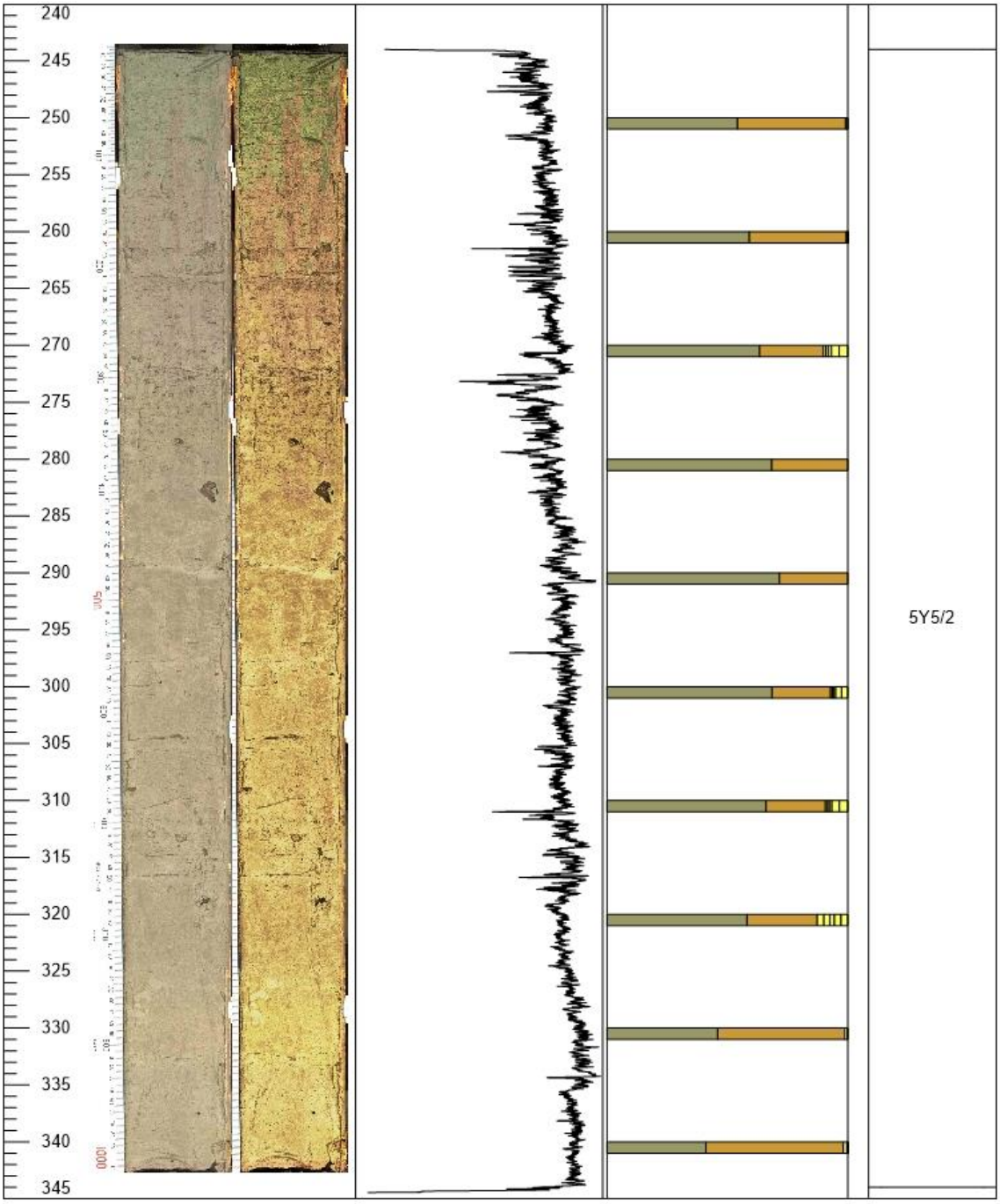
IN2017-V01-A005-PC01-13B
49-143 cm



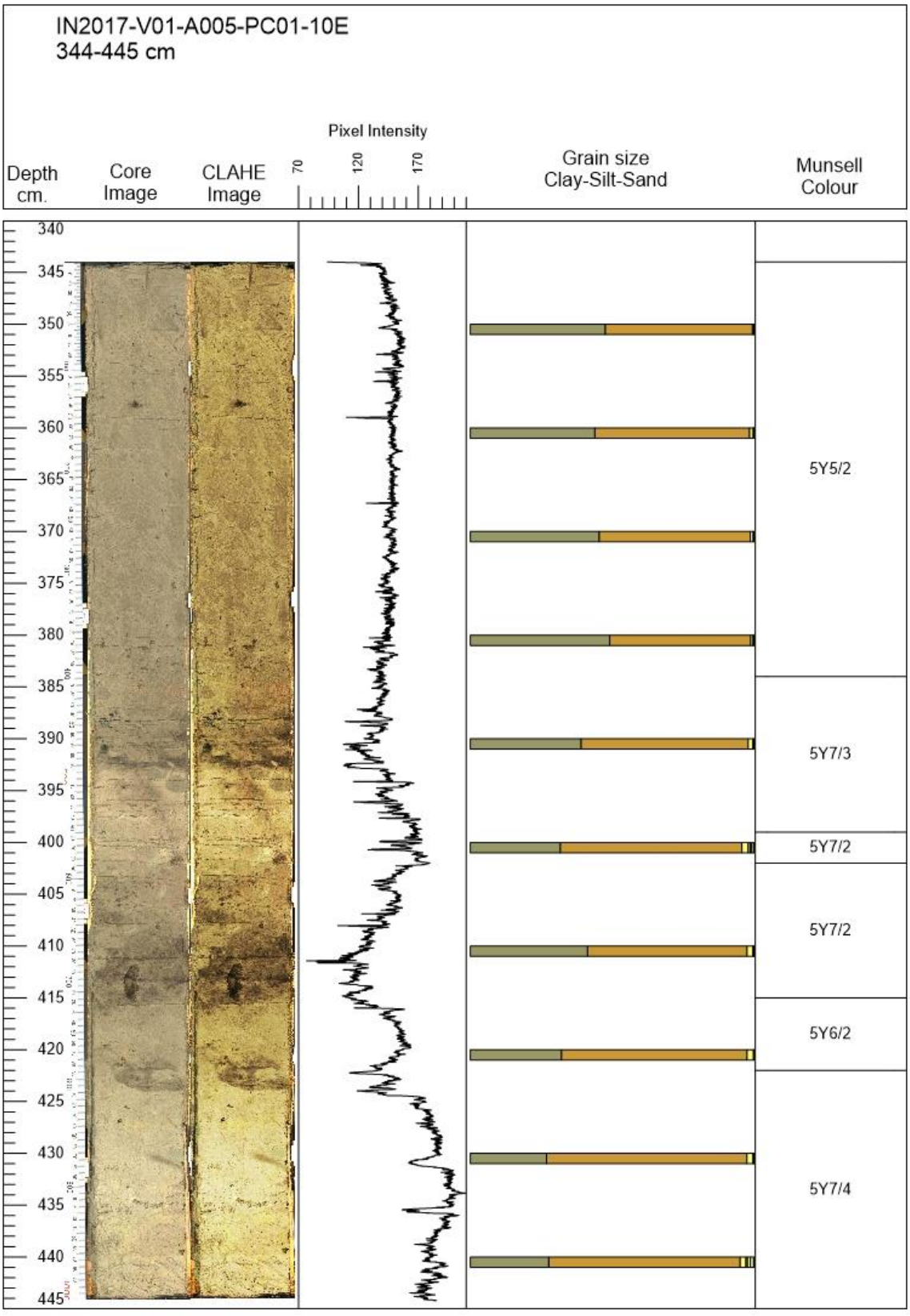
IN2017-V01-A005-PC01-12C
143-244 cm.



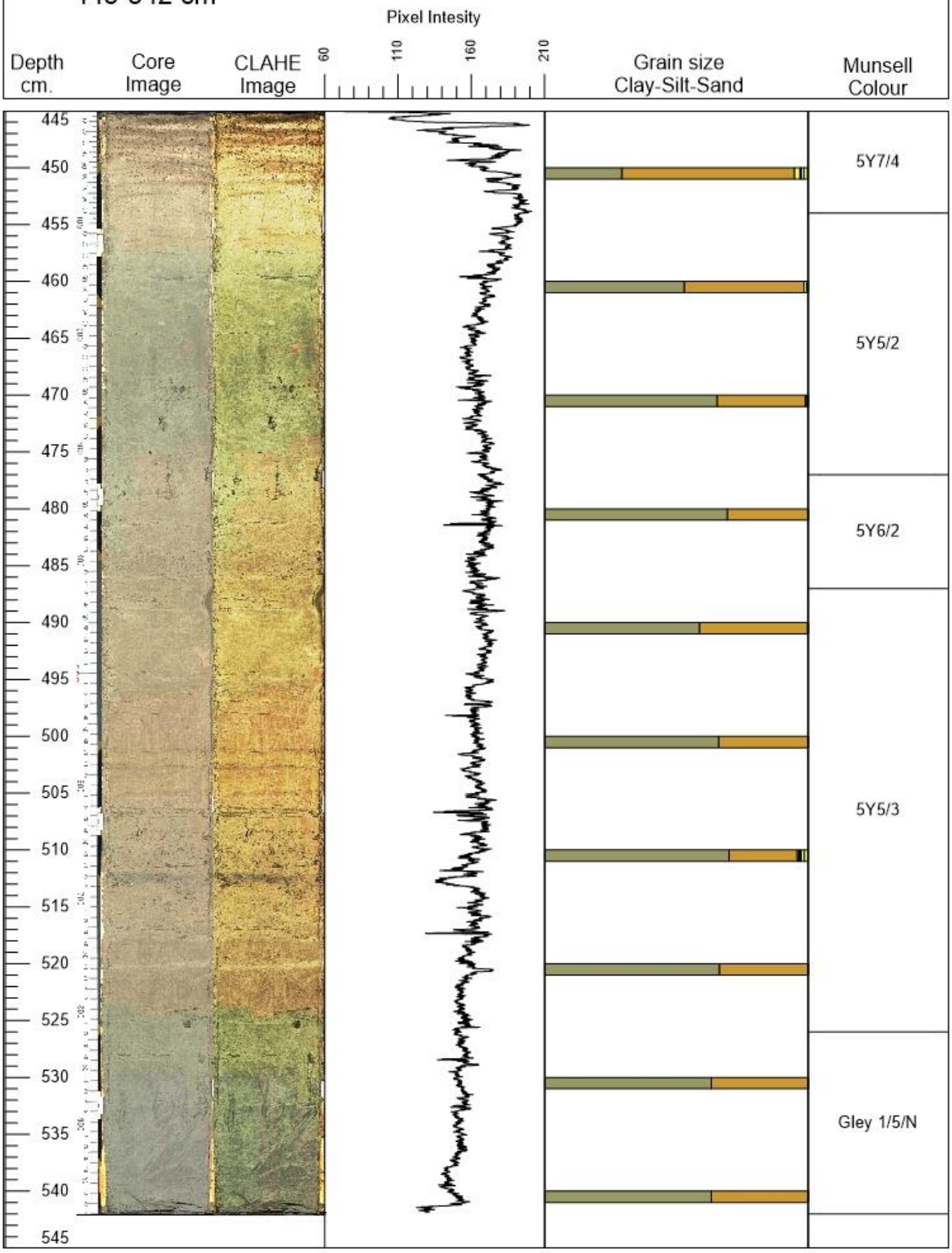
IN2017-V01-A005-PC01-11D
244-344 cm



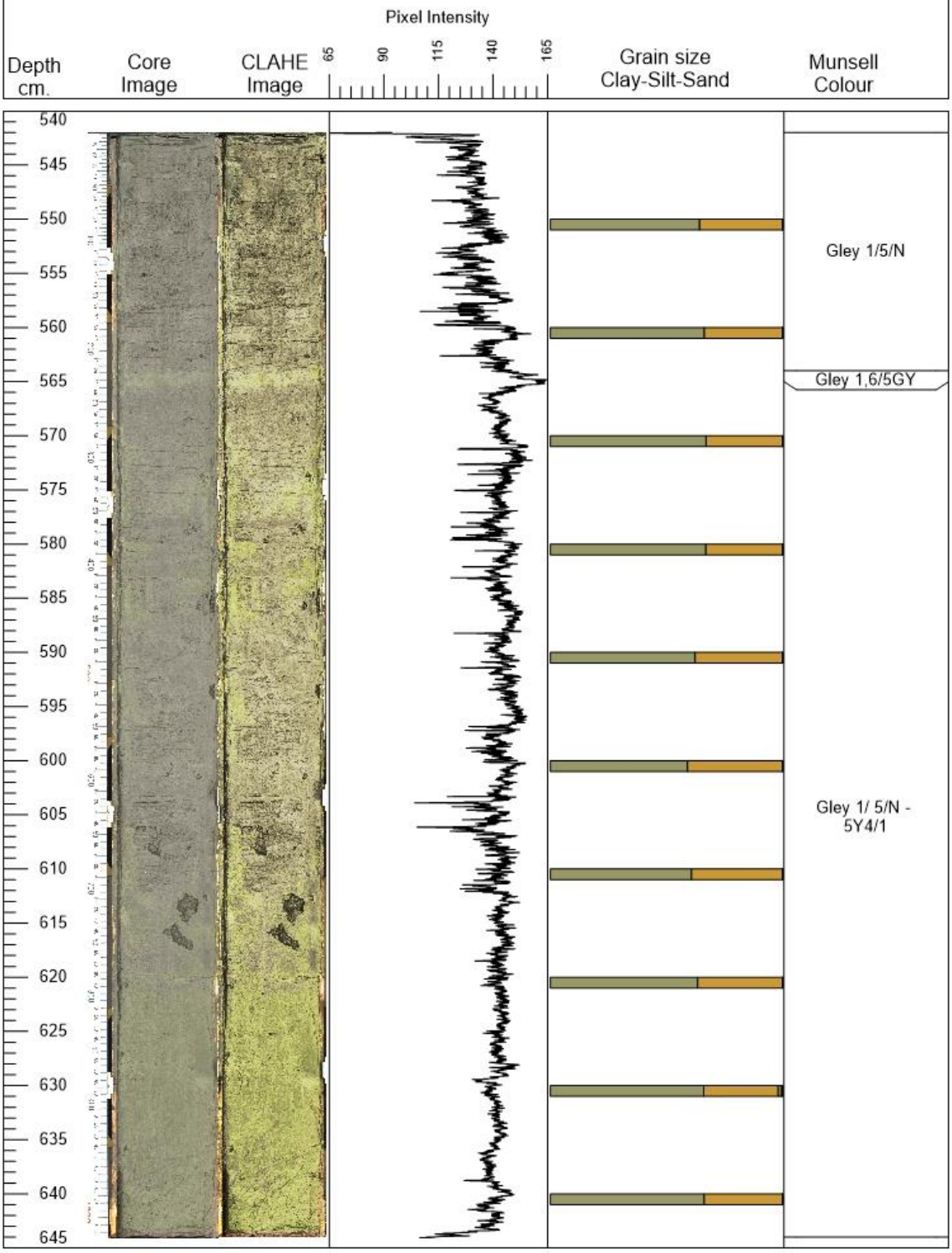
IN2017-V01-A005-PC01-10E
344-445 cm



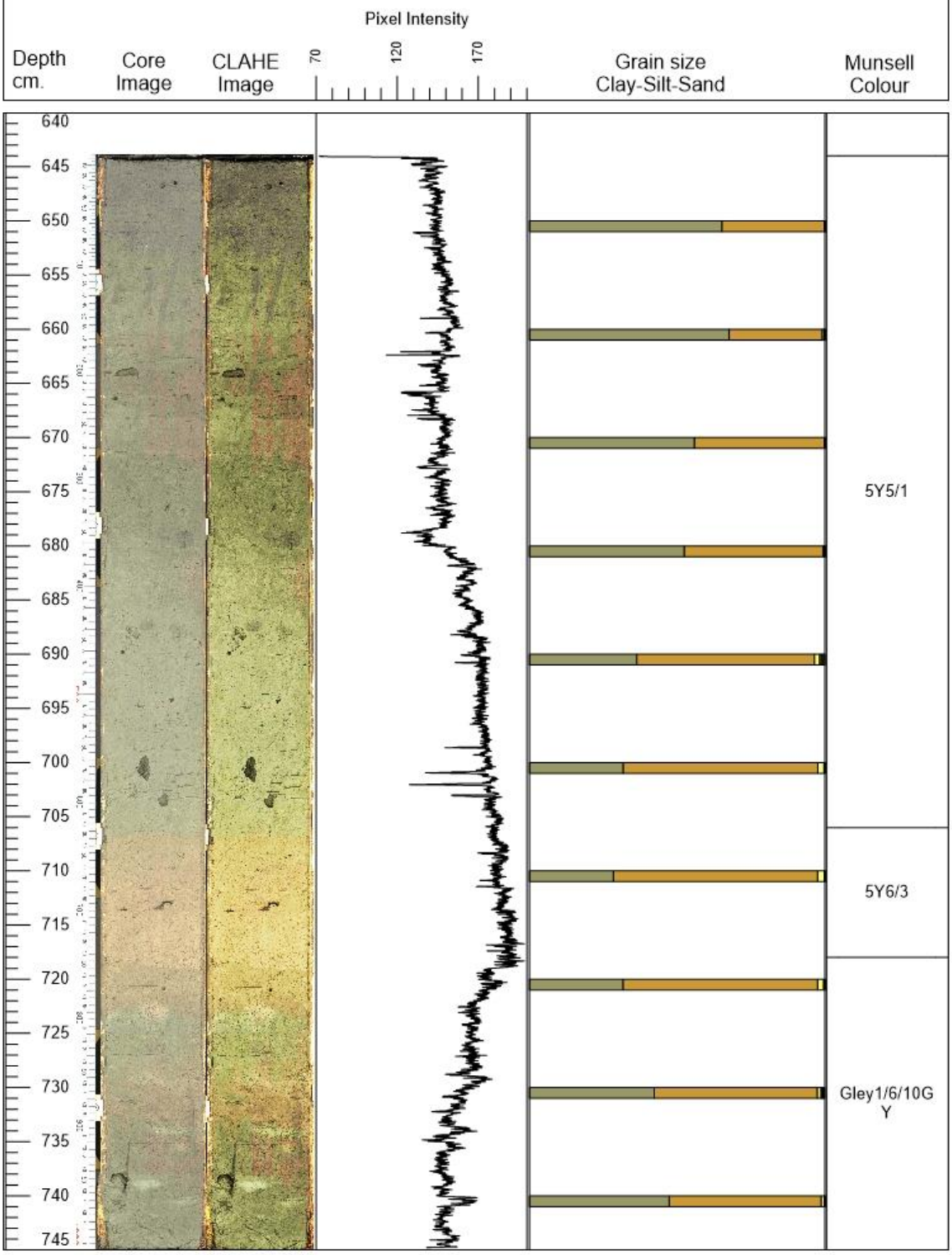
IN2017-V01-A005-PC01-09F
445-542 cm



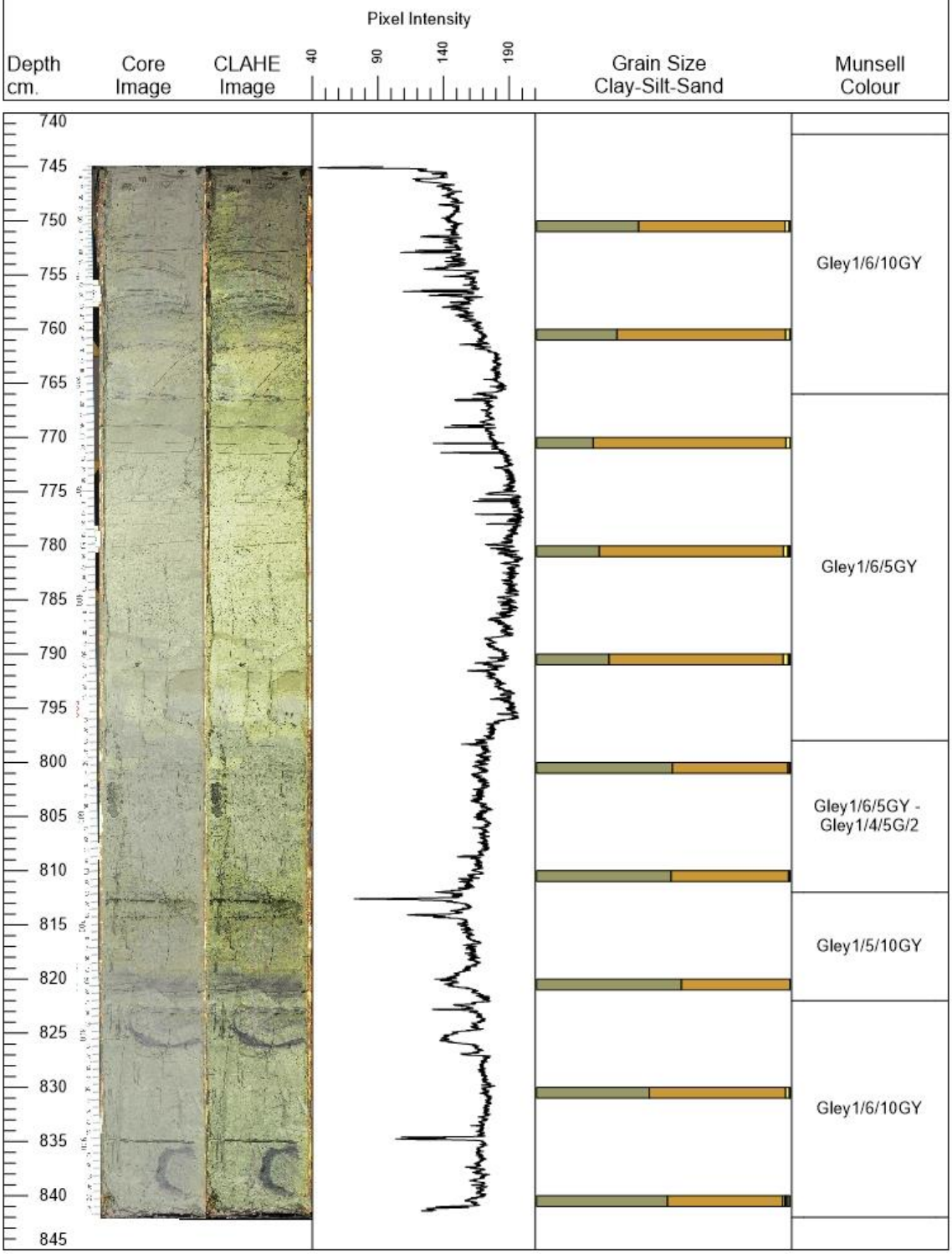
IN2017-V01-A005-PC01-08G
542-644 cm.



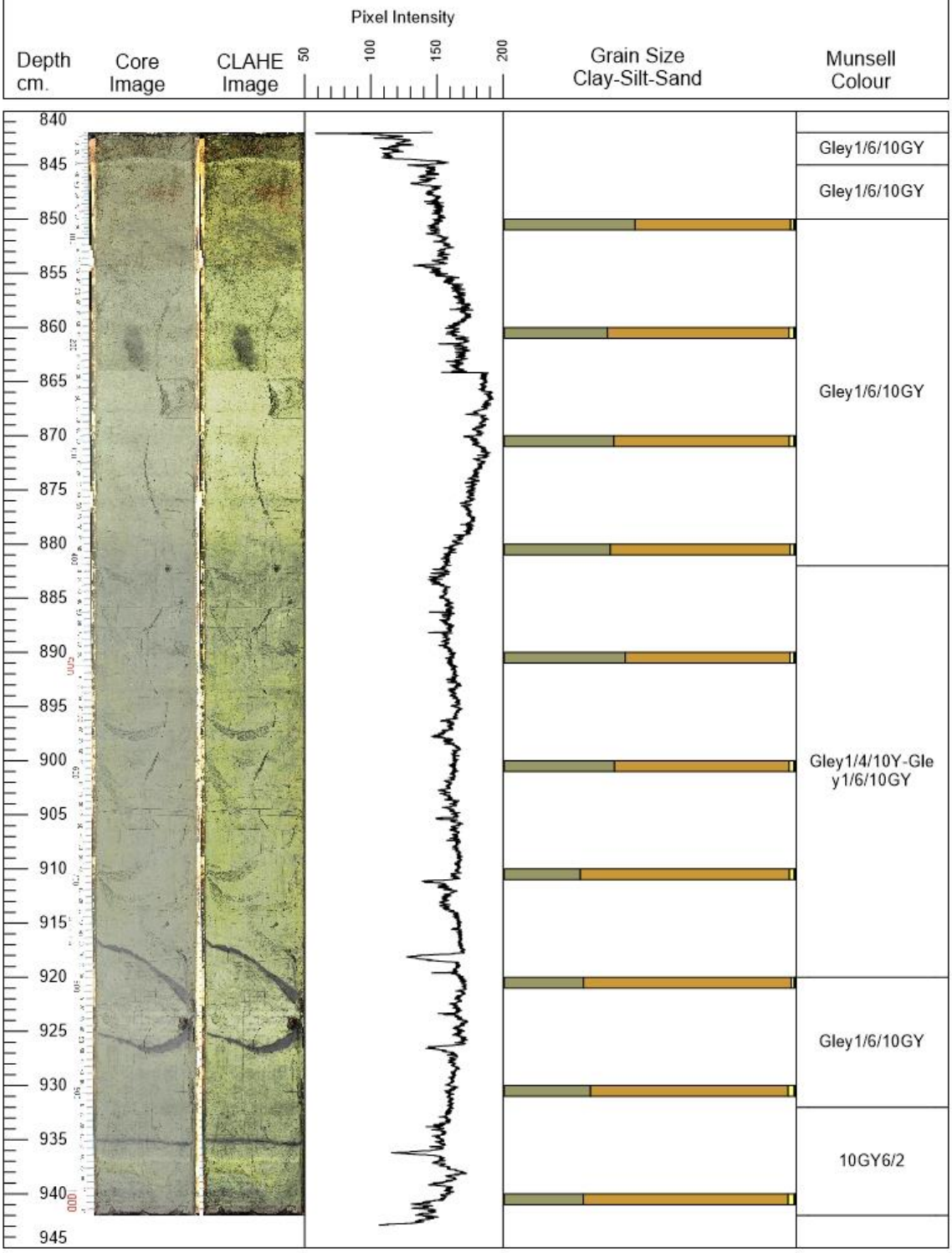
IN2017-V01-A005-PC01-07H
644-745 cm.



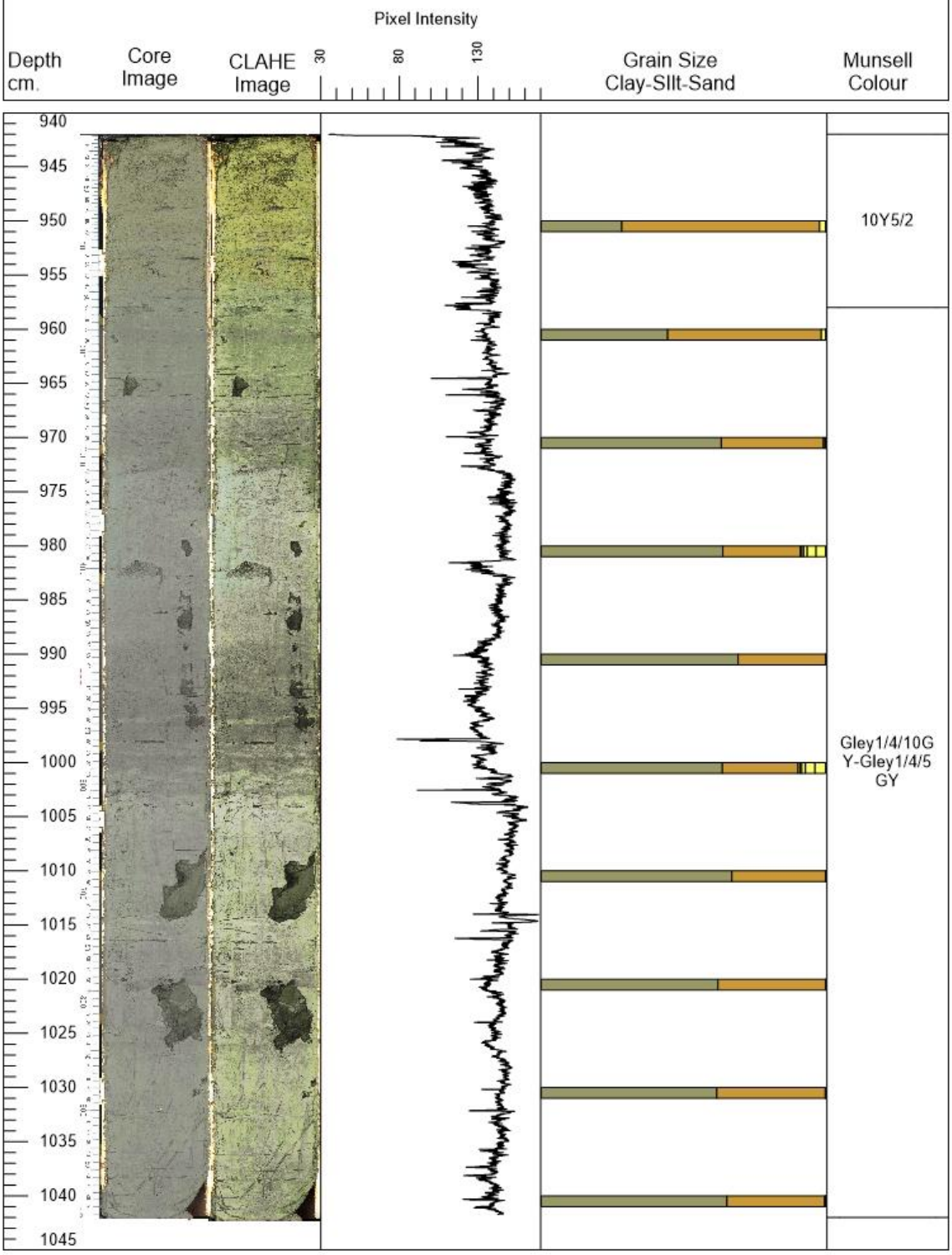
IN2017-V01-A006-PC01-06I
745-842 cm.



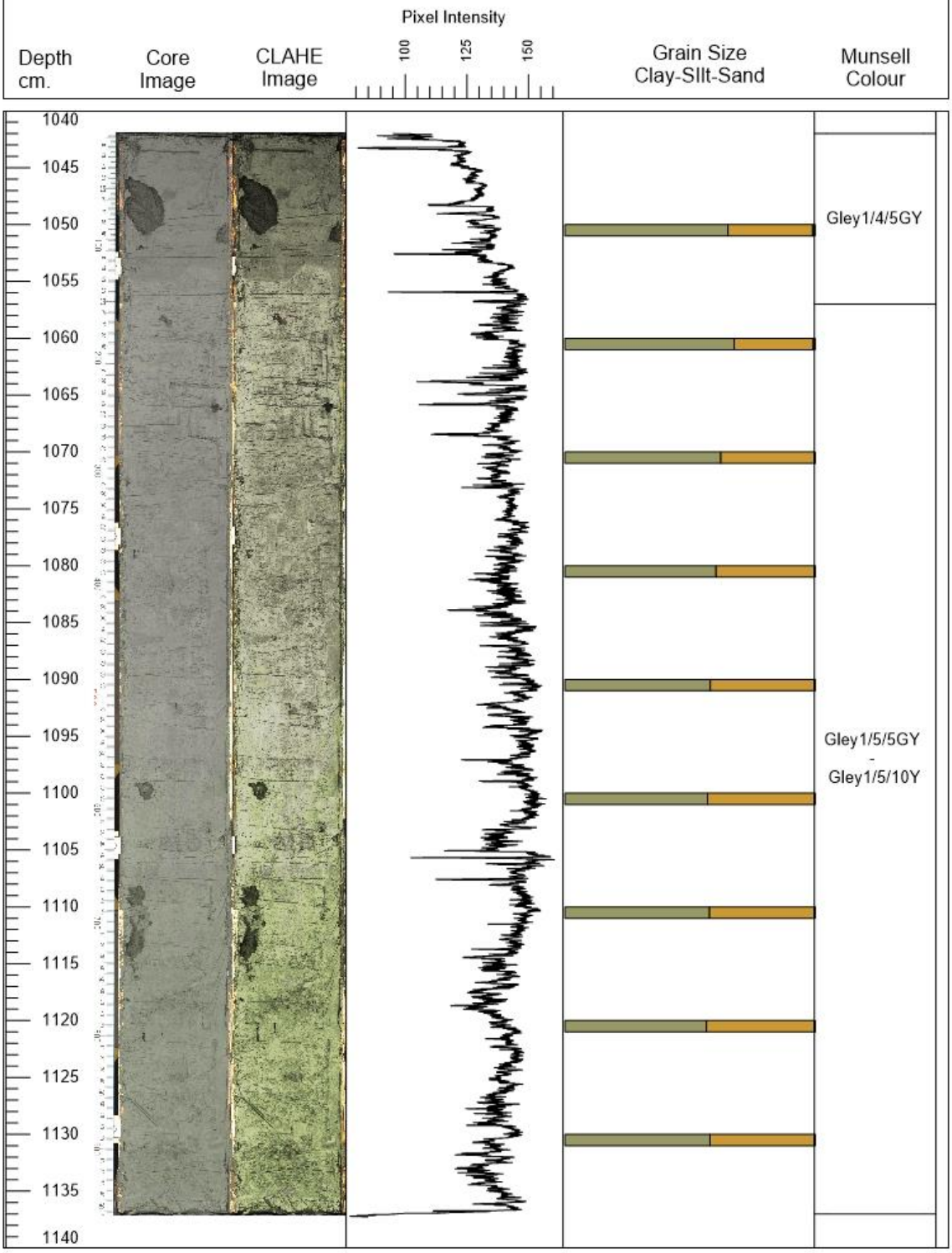
IN2017-V01-A005-PC01-05J
842-942 cm



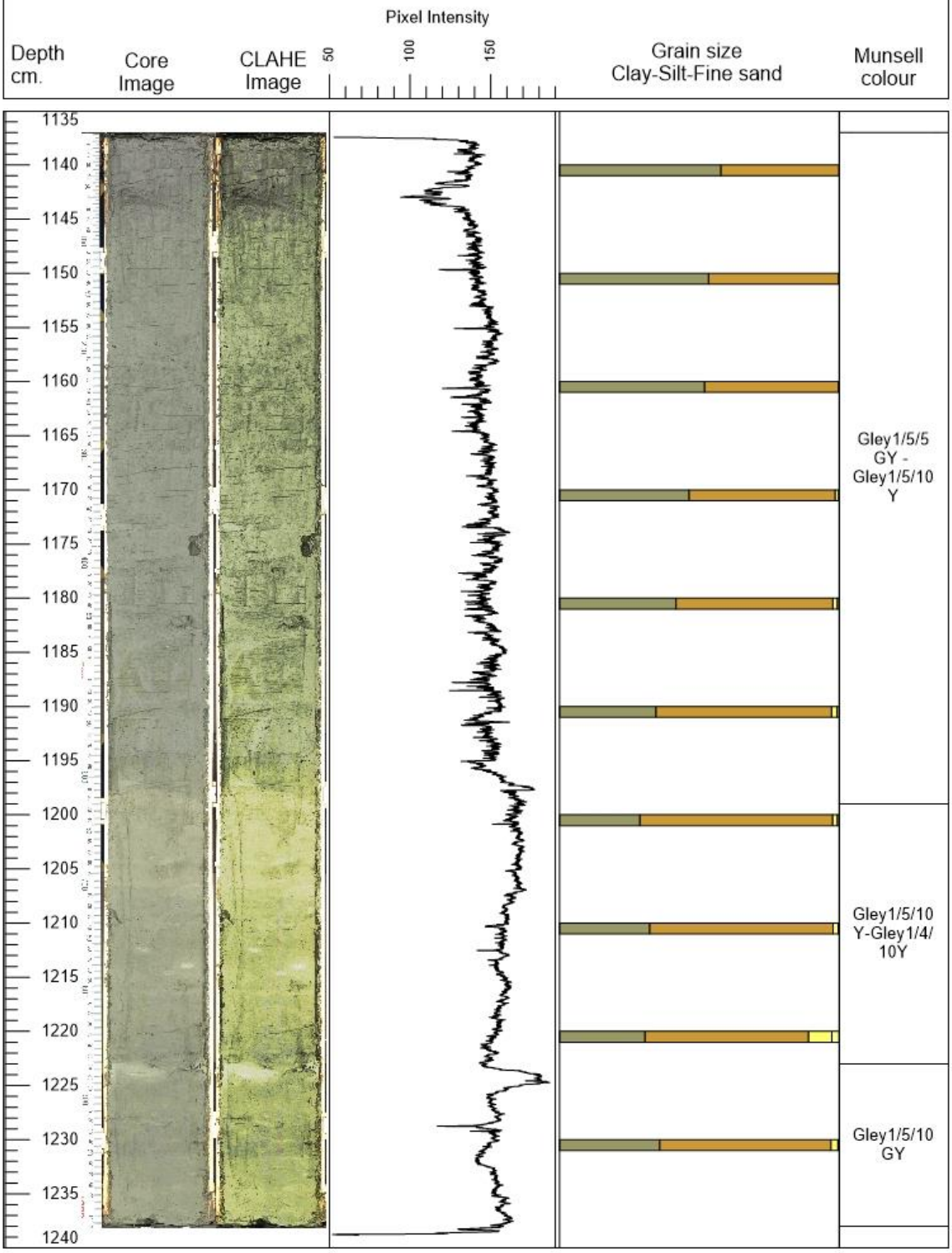
IN2017-V01-A005-PC01-04K
942-1042 cm.



IN2017-V01-A005-PC01-03L
1042-1137 cm.



IN2017-V01-A005-PC01-02M
1137-1238 cm



IN2017-V01-A005-PC01-01N
1238-1338 cm.