

Onboard Preliminary Report of KR05-15 cruise of R/V Kairei

West Caroline Basin

28 October 2005 (Guam) – 8 November 2005 (Guam)



Contents

| | |
|--|----|
| 1. Purpose of the KR05-15 cruise | 2 |
| 2. Summary of the KR05-15 cruise | |
| 2.1 Vessel | 3 |
| 2.2 Dates | 3 |
| 2.3 Survey area | 3 |
| 2.4 Ship log | 4 |
| 2.5 Participants | 6 |
| 3. Site survey | |
| 3.1 Topography and sub-bottom profiles | 11 |
| 3.2 Single-channel seismic reflection survey | 18 |
| 4. Piston coring | |
| 4.1 Summary | 25 |
| 4.2 Coring method and sample handling | 26 |
| 4.3 Visual core description and photograph | 28 |
| 4.4 Color reflectance | 36 |
| 4.5 Future works | 45 |
| Appendix | |
| Visual core description sheets | |

1. Purpose of the KR05-15 cruise

This cruise is to implement the proposal No. S05-03 for the JAMSTEC deep-sea research, “Paleoclimatic and Orbital Modulation of the Earth's Magnetic Field: Site survey for IODP proposal 612”

Recently, paleomagnetists have argued a possibility of orbital modulation of the geomagnetic field: presence or absence of the Milankovitch orbital frequencies in geomagnetic paleointensity records. This is fundamentally important for the geomagnetism because it suggests a possibility that part of energy for the geodynamo may come from outside the Earth's core. The main criticism to the orbital modulation hypothesis is that it might be an artifact induced by magnetic property changes of sediments, which is controlled by lithological changes caused by paleoclimatic changes. To solve this problem, it is necessary to compare paleomagnetic records from sediments of various lithologies. We plan to examine effect of carbonate contents in sediments to geomagnetic paleointensity estimation. We have chosen the West Caroline Basin (WCB) for this purpose because it is known that sediments in this area can yield exceptionally excellent paleomagnetic records, which is based on results from piston cores taken previously in WCB at depths close to the carbonate compensation depth (CCD). One of the purposes of this cruise is to take cores from various depths shallower than the CCD, and evaluate the effect of carbonate content changes on geomagnetic paleointensity estimation. The sediment cores taken will be used also for geochemical and micropaleontological analyses in order to assign ages for the sediments and to understand sedimentary environment.

Another objective of this cruise is to conduct a site survey for the IODP (Integrated Ocean Drilling Program) proposal 612-Full2. This proposal aims to clarify long-term secular variations of the geomagnetic field in both intensity and direction during the last 10 m.y. with special emphasis on testing the hypothesis of the orbital modulation of the geomagnetic field. One of the high priority sites of this proposal is in the West Caroline Basin partly because high quality paleomagnetic data during the last 2 to 3 m.y. were previously obtained using sediment cores from this area. But all previous coring sites were close to CCD. SSEP (Science Steering and Evaluation Panel) of IODP requested to find appropriate sites with water depths enough shallower than CCD, because sediments from such sites can be dated by oxygen isotope and can be used for paleoceanography as well as paleomagnetism.

2. Summary of the KR05-15 cruise

2.1 Vessel

R/V Kairei owned by Japan Agency for Marine-Earth Science and Technology

Overall length: 105 m

Gross tonnage: 4,628 tons

2.2 Dates

Left Guam on 28 October, 2005

Arrived at Guam on 8 November, 2005

2.3 Survey Area

The West Caroline Basin, within the rectangular in Figure 2.3-1.

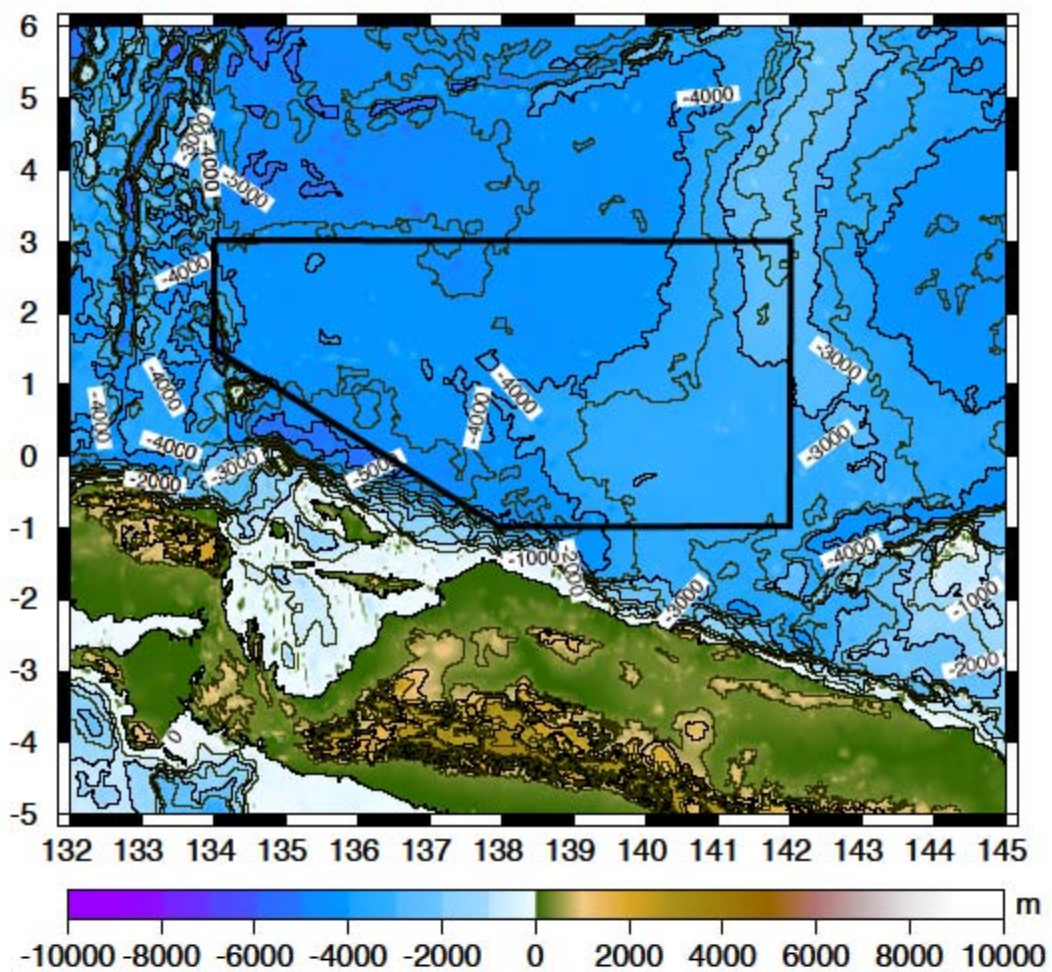


Figure 2.3-1 Survey area of KR05-15 cruise in the West Caroline Basin.

2.4 Ship log

| Date | Time | Observation |
|-------|-------|---|
| 10.28 | 14:00 | Leave Guam |
| 10.29 | | Transit to survey area (southeastern part) |
| 10.30 | 11:00 | Deploy proton magnetometer |
| | 11:20 | Deploy XBT |
| | 12:55 | Start topographic and magnetic survey |
| 10.31 | 13:55 | End topographic and magnetic survey |
| | 15:35 | Retrieve proton magnetometer |
| | 15:55 | Deploy GI-gun and hydrophone |
| | 17:17 | Start single-channel seismic reflection (SCS) survey line |
| 11.1 | 8:27 | End SCS line |
| | 8:37 | Retrieve GI-gun and hydrophone |
| | 8:41 | Deploy XBT |
| | 9:16 | Start piston coring (PC-01) |
| | 12:10 | End piston coring |
| | 14:38 | Start topographic survey line |
| | 15:50 | End topographic survey line |
| | 16:21 | Deploy GI gun and hydrophone |
| | 16:57 | Start SCS line |
| 11.2 | 6:54 | End SCS line |
| | 7:04 | Retrieve GI-gun and hydrophone |
| | 8:30 | Start piston coring (PC-02) |
| | 11:35 | End piston coring |
| | 11:46 | Deploy proton magnetometer |
| | 12:01 | Figure-8 turn (Calibration of three-component magnetometer) |
| | 12:38 | Start topographic and magnetic survey line |
| | 15:16 | End topographic and magnetic survey line |
| | 15:28 | Retrieve proton magnetometer |
| | 15:36 | Deploy GI-gun and hydrophone |
| | 16:19 | Start SCS line |
| 11.3 | 6:09 | End SCS line |
| | 7:03 | Retrieve GI-gun and hydrophone |
| | 8:35 | Start piston coring (PC-03) |
| | 11:43 | End piston coring |
| | 11:53 | Deploy proton magnetometer |

| | | |
|------|-------|---|
| | | Transit to the western part of the survey area Topographic and magnetic survey |
| 11.4 | 12:55 | Retrieve proton magnetometer |
| | 13:17 | Deploy GI-gun and hydrophone |
| | 13:52 | Start SCS line |
| 11.5 | 6:19 | End SCS line |
| | 7:07 | Retrieve GI-gun and hydrophone |
| | 8:08 | Start piston coring (PC-04) |
| | 11:30 | End piston coring |
| | 11:40 | Deploy proton magnetometer |
| | 12:15 | Figure-8 turn (Calibration of three-component magnetometer) |
| | 13:10 | Start topographic and magnetic survey line |
| | 16:00 | End topographic and magnetic survey line |
| | | Transit to Guam |
| | 20:48 | Figure-8 turn (Calibration of three-component magnetometer) End observation |
| 11.6 | 6:15 | Retrieve proton magnetometer |
| 11.7 | | Transit to Guam |
| 11.8 | 9:00 | Arrive at Guam |

2.5 Participants

(1) Scientific team

Dr. Toshitsugu Yamazaki (Chief Scientist)

Group Leader

Geological Survey of Japan, AIST

Dr. Toshitya Kanamatsu

Researcher

Japan Agency of Marine-Earth Science and Technology (JAMSTEC)

Dr. Hirokuni Oda

Senior Researcher

Geological Survey of Japan, AIST

Dr. Yusuke Sukanuma

Post-doctoral Research Fellow

Geological Survey of Japan, AIST

Mr. Mitsuru Yamamura

Graduate Student

Graduate School of Science, Tohoku University

also Geological Survey of Japan, AIST

Ms. Sakiko Mizuno
Graduate Student
Graduate School of Science, Kochi University

Mr. Eddy Z. Gaffar
Researcher
Research Centre for Geotechnology, LIPI

Mr. Dodi R. Galih
Researcher
Research Centre for Geotechnology, LIPI

Mr. Satoshi Shimizu
Chief marine technician
Nippon Marine Enterprises, Ltd.

Mr. Keigo Suzuki
Marine technician
Nippon Marine Enterprises, Ltd.

Mr. Ichiro Nara
Marine technician
Nippon Marine Enterprises, Ltd.

Ms. Maki Ito
Marine technician
Nippon Marine Enterprises, Ltd.

Ms. Tamami Ueno
Marine technician
Marine Works Japan Ltd.

Ms. Yuko Sagawa
Marine technician
Marine Works Japan Ltd.

Mr. Yasushi Hashimoto
Marine technician
Marine Works Japan Ltd.

Mr. Toru Koizumi
Marine technician
Marine Works Japan Ltd.

(2) Security Officer

Mr. Jaka Prastya
Directorate for Regional Defense
Ministry of Defense, Indonesia

(3) Crew

| | |
|-------------|---------------------|
| Captain | Shinya Ryono |
| C/O | Satoshi Susami |
| 2/O | Naoto Kimura |
| 3/O | Hiroyuki Kato |
| C/E | Hiroyoshi Kikkawa |
| 2/E | Takashi Ota |
| 3/E | Takafumi Tominaga |
| C/Op | Tokinori Nasu |
| 2/Op | Katsutoshi Kitamura |
| 3/Op | Hiroki Ishiwata |
| Boatswain | Yasuyoshi Kyuki |
| Able Seaman | Kuniharu Kadoguchi |
| Able Seaman | Osamu Tokunaga |
| Able Seaman | Hideo Isobe |
| Able Seaman | Masanori Ohata |
| Able Seaman | Yutaka Sato |
| Able Seaman | Yoshiaki Matsuo |
| No.1 Oiler | Masaru Kitano |
| Oiler | Tsuneo Harimoto |
| Oiler | Junji Mori |
| Oiler | Hiroshi Yamamoto |
| Oiler | Sakoh Tanaka |
| C/S | Takeshi Miyauchi |
| Cook | Sueto Sasaki |
| Cook | Hideo Fukumura |
| Cook | Hiroyuki Yoshizawa |
| Cook | Hiroaki Yaoita |

3. Site survey

During the KR05-15 cruise, two small areas in the West Caroline Basin were surveyed: the southeastern part and the western part.

First, seafloor topographic mapping and sub-bottom acoustic reflection profiling were conducted in order to find appropriate sites for piston coring using a SeaBeam 2112 multi-narrow-beam echo-sounder with 4 kHz sub-bottom profiler, which is equipped with R/V Kairei. Sub-bottom profiling was not carried out during nighttime from 20:00 to 06:00. XBT measurements for sound velocity correction were conducted twice.

Next, a single-channel seismic reflection survey was conducted in the vicinity of each coring site to investigate sedimentary structure and thickness of sediments above the oceanic crust. Two lines of 20 to 30 miles each were occupied, which run north-south and east-west directions. Coring sites are at or near the cross points of the two lines. Ship's speed was 4 knots in general. Detailed description of observation conditions and preliminary results are presented in the section 3.2.

Gravity and magnetic measurements were also carried out along topographic survey lines. A shipboard gravity meter (Bodenseewerk KSS311) was used, and relative gravity values were connected to absolute gravity at the Gaum port. Magnetic measurements were performed by a proton magnetometer (Kawasaki PRT010) and a shipboard three-component magnetometer system (Tierra Technica SFG1214). To evaluate induced and permanent magnetization of the ship, "figure-8 turn" was conducted three times. The proton magnetometer was not towed during single-channel seismic reflection profiling.

3.1 Topography and sub-bottom profiles

Figures 3.1-1 and 3.1-2 show bathymetric maps of the southeastern and western parts of the West Caroline Basin. An enlarged bathymetric map and a sub-bottom profile around each coring site were displayed in Figures 3.1-3 through 3.1-6.

From sub-bottom profiles, it is recognized that the survey areas are covered with well-stratified thick sedimentary layers except for small seamounts. A characteristic feature of the survey areas is the gently undulating seafloor. Relative height is on the order of 10m. From sub-bottom profiles, it is revealed that the undulation is caused by occurrence of numerous faulted blocks. The both survey areas are on a bulge of the subducting Caroline Plate along the New Guinea Trench, and hence they are estimated to be normal faults induced by a bend of the plate.

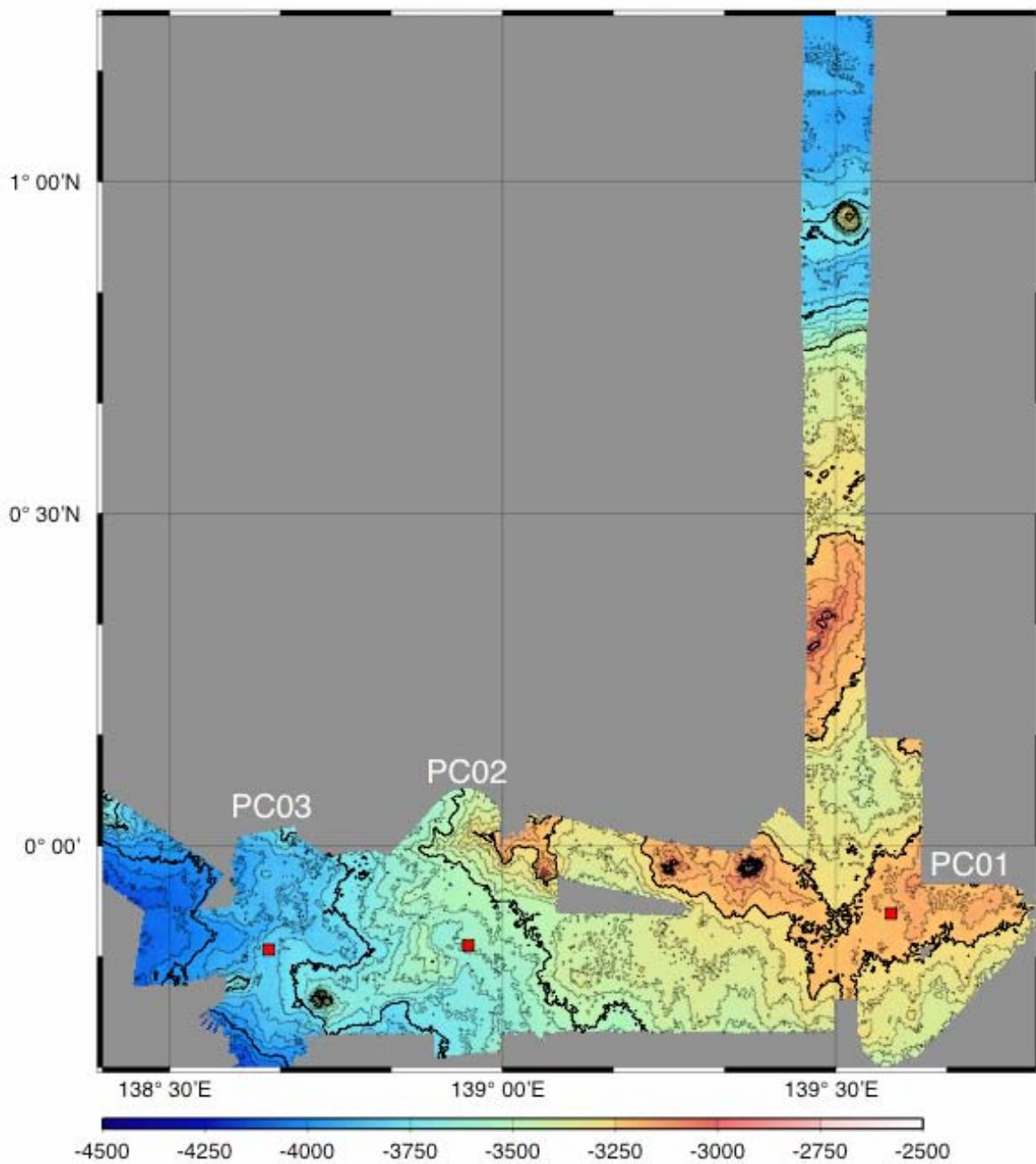


Figure 3.1-1 Topographic map of the southeastern survey area in the West Caroline Basin.

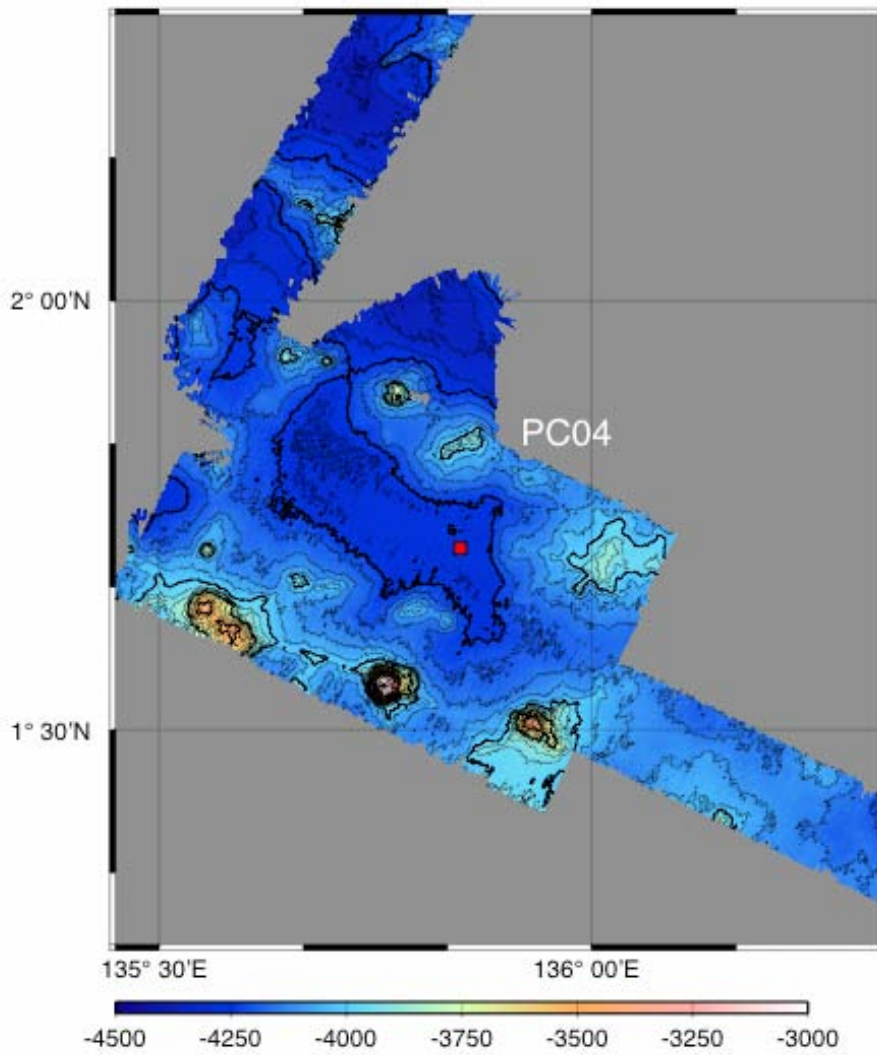


Figure 3.1-2 Topographic map of the western survey area in the West Caroline Basin.

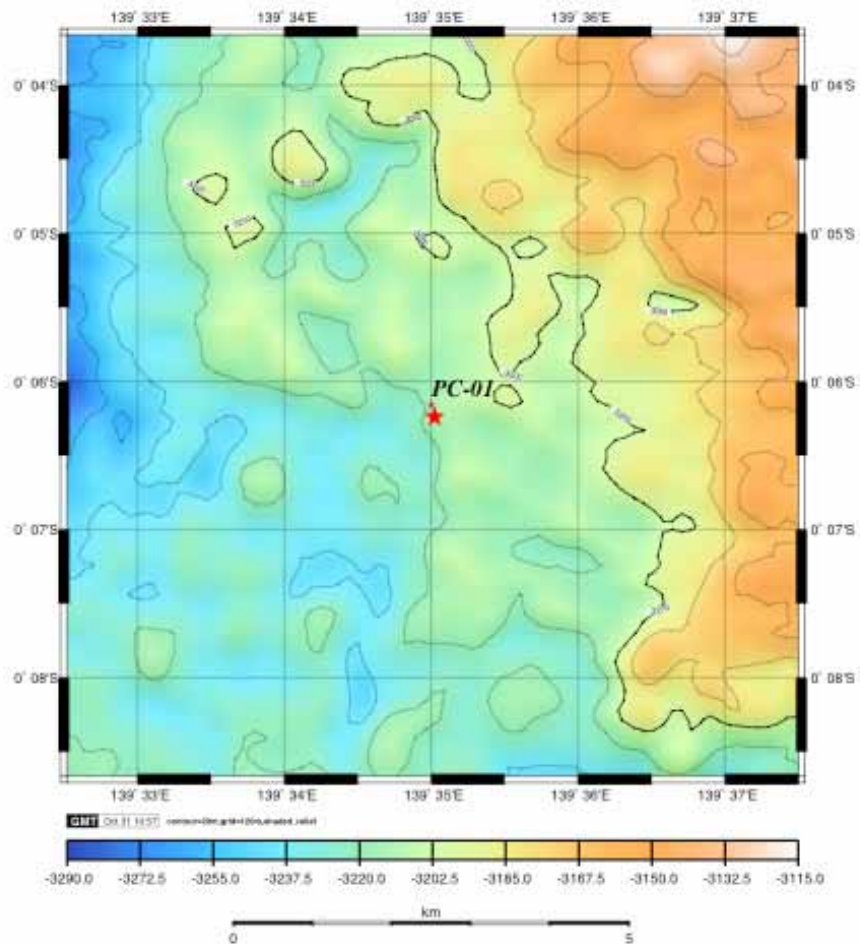
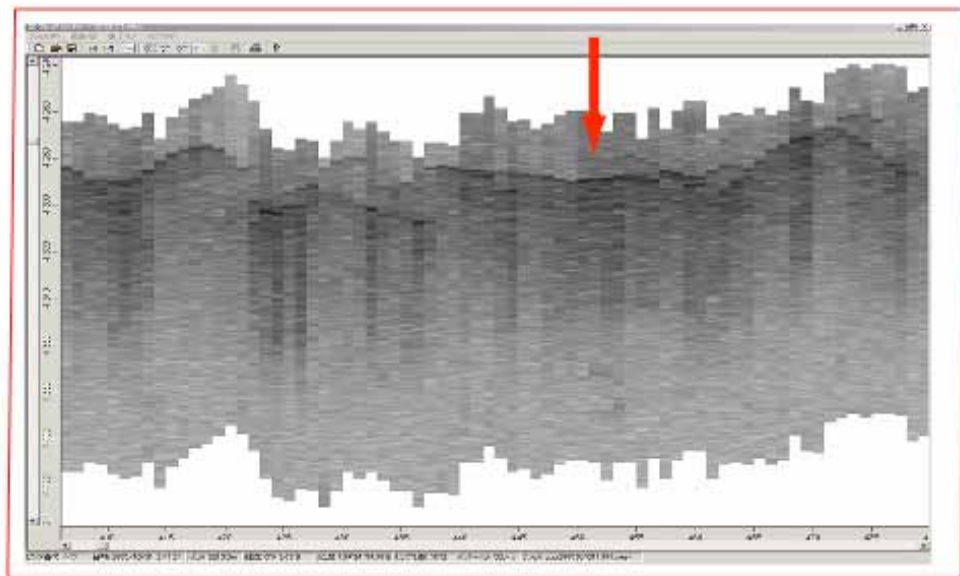


Figure 3.1-3 Topographic map and sub-bottom profile around the site PC-01.

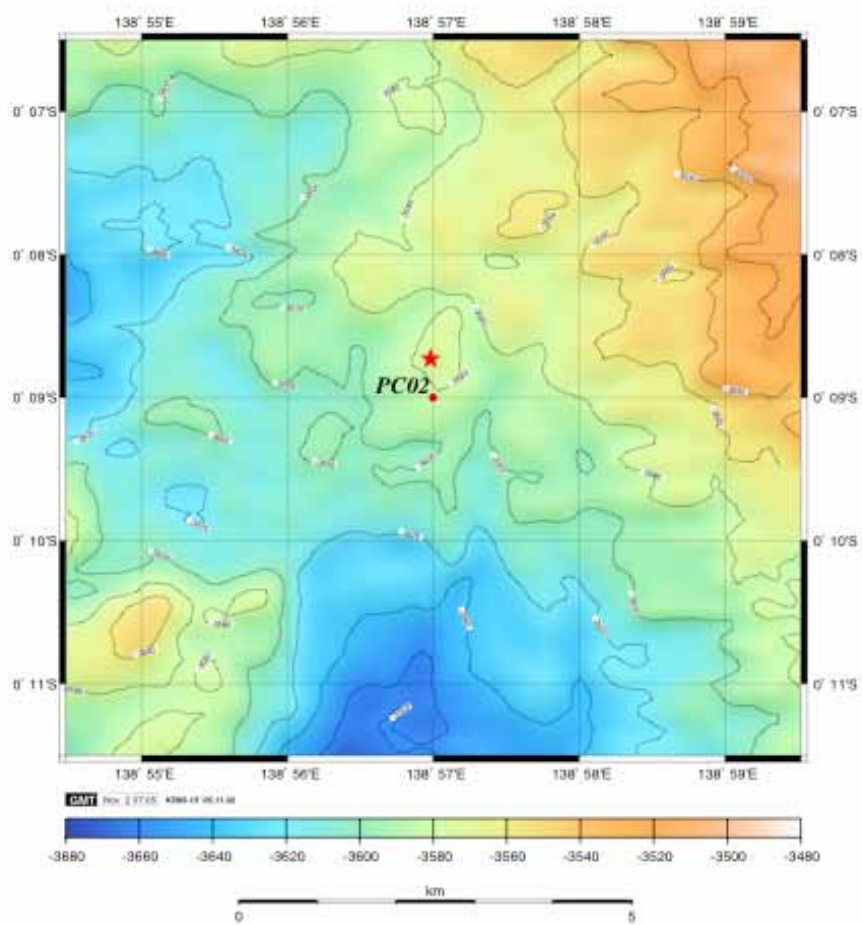
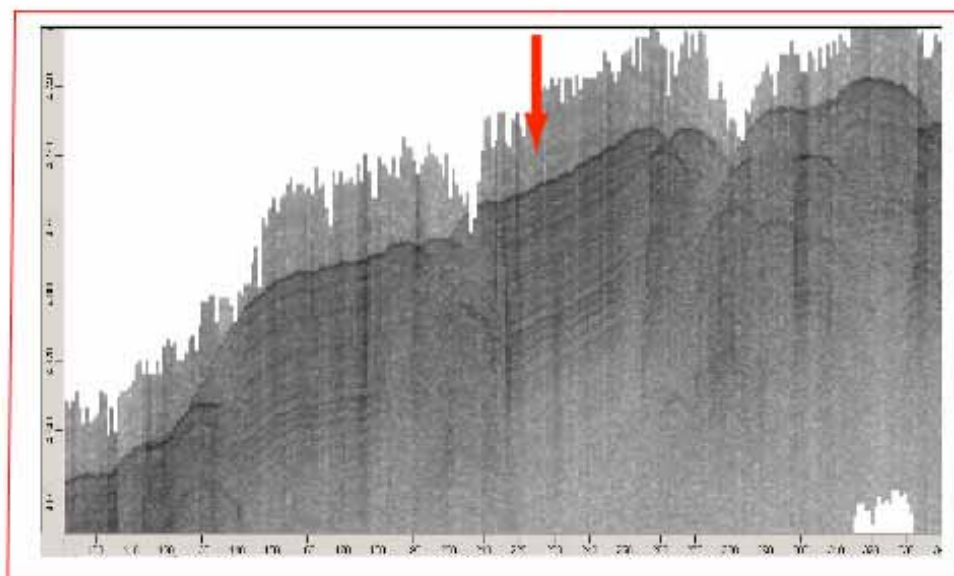


Figure 3.1-4 Topographic map and sub-bottom profile around the site PC-02.

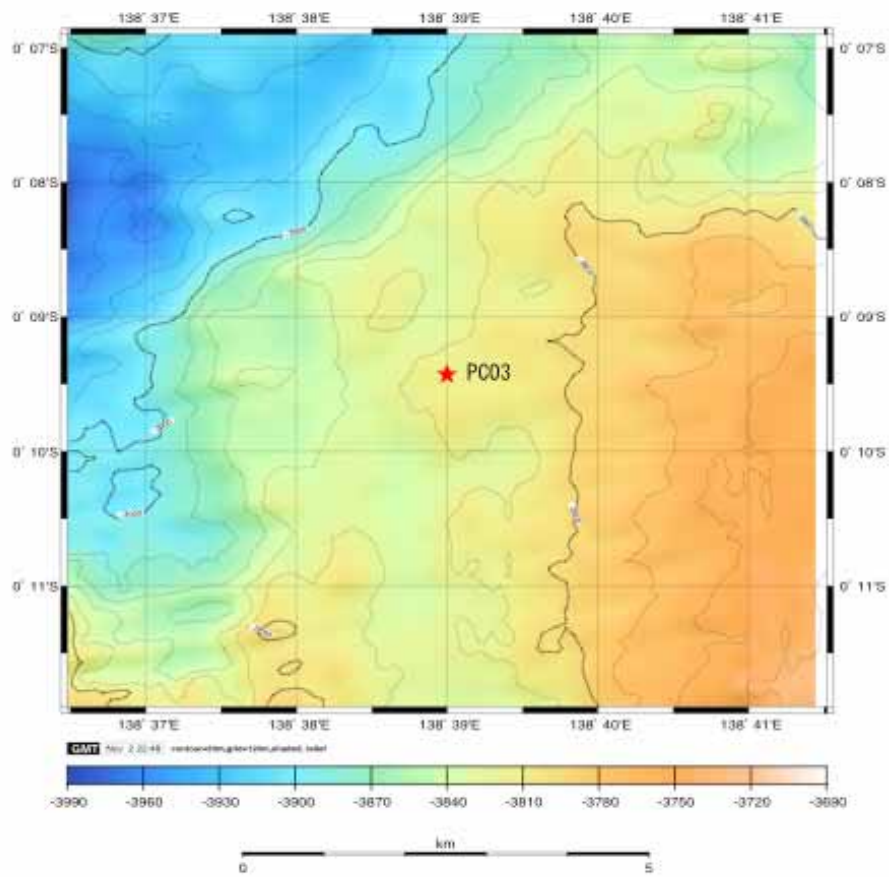
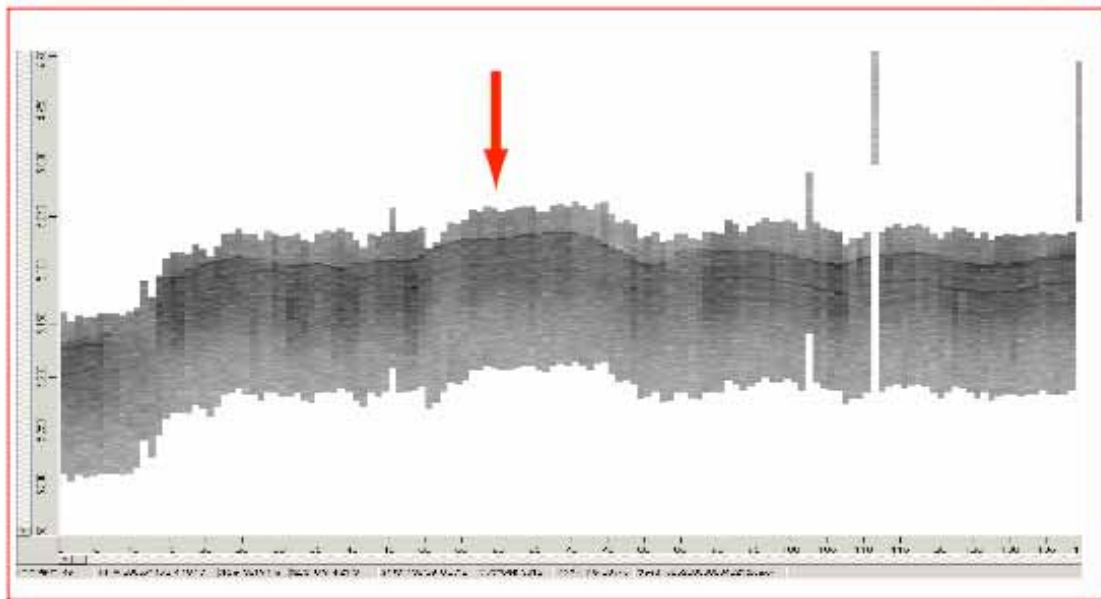


Figure 3.1-5 Topographic map and sub-bottom profile around the site PC-03.

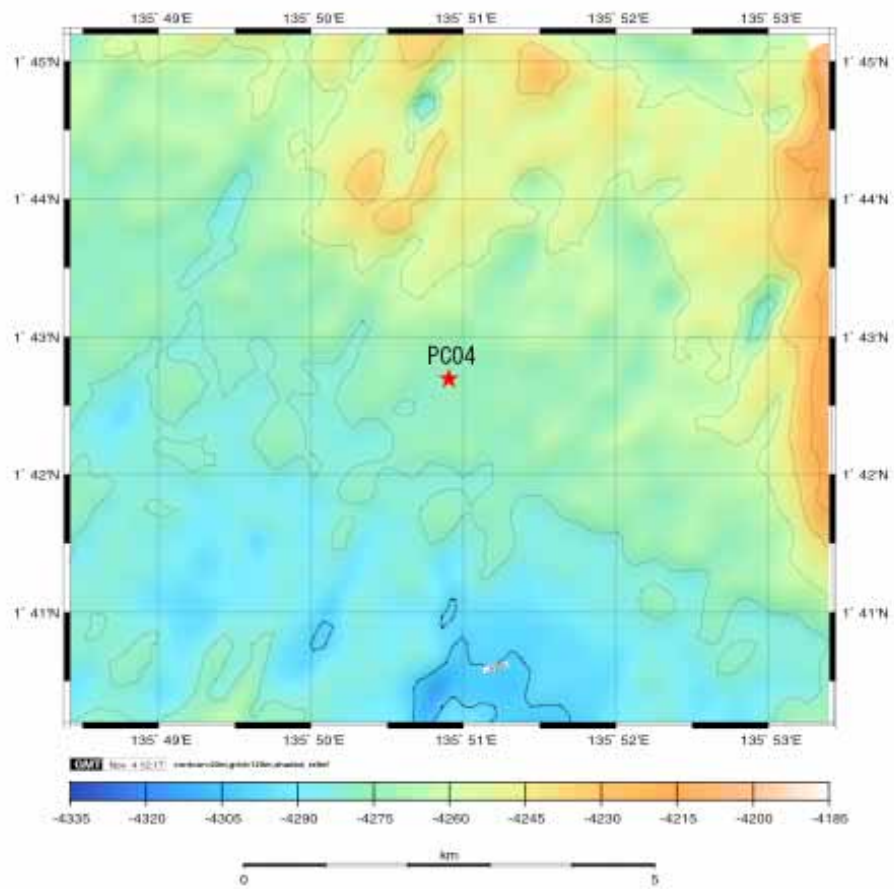
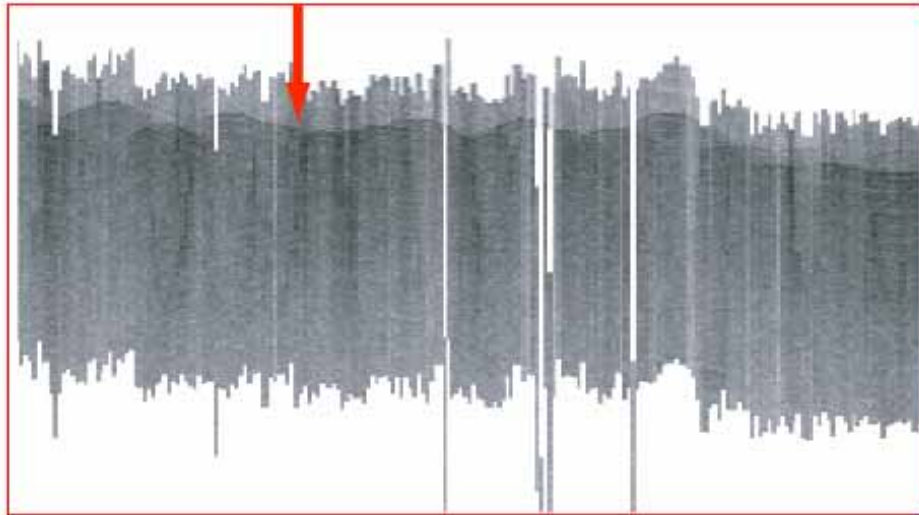


Figure 3.1-6 Topographic map and sub-bottom profile around the site PC-04.

3.2 Single-channel seismic reflection survey

The equipment and specification of the single channel seismic survey are as follows.

Streamer

| | |
|-----------------------|------------------------------------|
| Manufacturer | S.I.G |
| Active section length | 65m |
| Hydrophone Interval | 1m |
| Type of Hydrophone | S.I.G.16.48.65 |
| Hydrophone output | -90 dB re 1V/ μ bar, \pm 1dB |
| Frequency | flat from 10Hz to 1000Hz |
| Depth sensor | Yes |
| Preamplifier | 39dB |
| Lead in cable | 135m |
| Receiver depth | 3-5m |

Source

| | |
|----------------|---------------------------|
| Manufacturer | Sercel |
| Type of airgun | GI-150 |
| Volume | 210cu.in. ([G]105+[I]105) |
| Air pressure | 2000psi |
| Source depth | 4.0m |
| Depth sensor | Yes (Off line sensor) |
| Gun Controller | GI-01 |

Air Compressor

| | |
|---------------------|---------------------------------------|
| Manufacturer | Leobersdorfer Maschinenfabrik AG Wien |
| Type of machine | LMF 24/150-E60(VC 2214 w15) |
| Air supply Capacity | 24m ³ /min. |

Recording System

| | |
|------------------|-----------------------------------|
| Manufacturer | IXEA |
| Type of system | Delph Seismic/Delph Seismic+Plus |
| Monitor | EPC The model GSP-1086 Printer |
| Recording format | SEG-Y |
| Recording length | 7.5sec |
| Sample rate | 1msec |
| High cut | Anti-aliasing filtering (>2KHz) |
| Lowcut | None |
| Recording media | HD |

Navigation

| | |
|-------------|---------|
| DGPS system | Starfix |
|-------------|---------|

Shot Point Geometry

| | |
|--------------------|---------------|
| Time mode shooting | 8sec interval |
|--------------------|---------------|

Geodetic Parameter

| | |
|----------|-------|
| Spheroid | WGS84 |
|----------|-------|

| | |
|-----------------|------------|
| Semi-major Axis | 6,378,160m |
|-----------------|------------|

| | |
|--------------------|--------|
| Inverse Flattening | 298.25 |
|--------------------|--------|

| | |
|------------|-------|
| Projection | U.T.M |
|------------|-------|

| | |
|------|--|
| Zone | Zone 54 S (southeast area)/ Zone 53 N (northwest area) |
|------|--|

Figure 3.2-1 shows the geometry of the seismic source, receiver, and vessel. Figure 3.2-2 displays the location of survey lines, and seismic reflection profiles are presented in Figures 3-2.3 through 3-2.6. The profiles are after applying a band-pass filter (ranging from 10 to 250 Hz with a flat band between 30 and 200 Hz) to static-shifted seismic reflection data.

All four sites show similar seismic characteristics. Acoustic basements, which correspond to oceanic crusts of Oligocene age, are covered with thick transparent sedimentary layers. Some reflectors are recognized in the middle to lower part of the sedimentary layer. At the sites of PC01 and PC02, the thickness of the sediments is about 0.7 sec. in two-way travel times (700m when a sound velocity of 2.0 km/sec. is assumed for the sediments). It is about 0.9 sec. at the site PC03, and 0.5 sec. at the site PC04. The numerous faults observed on the topography and sub-bottom profiles can also be recognized on the seismic reflection profiles.

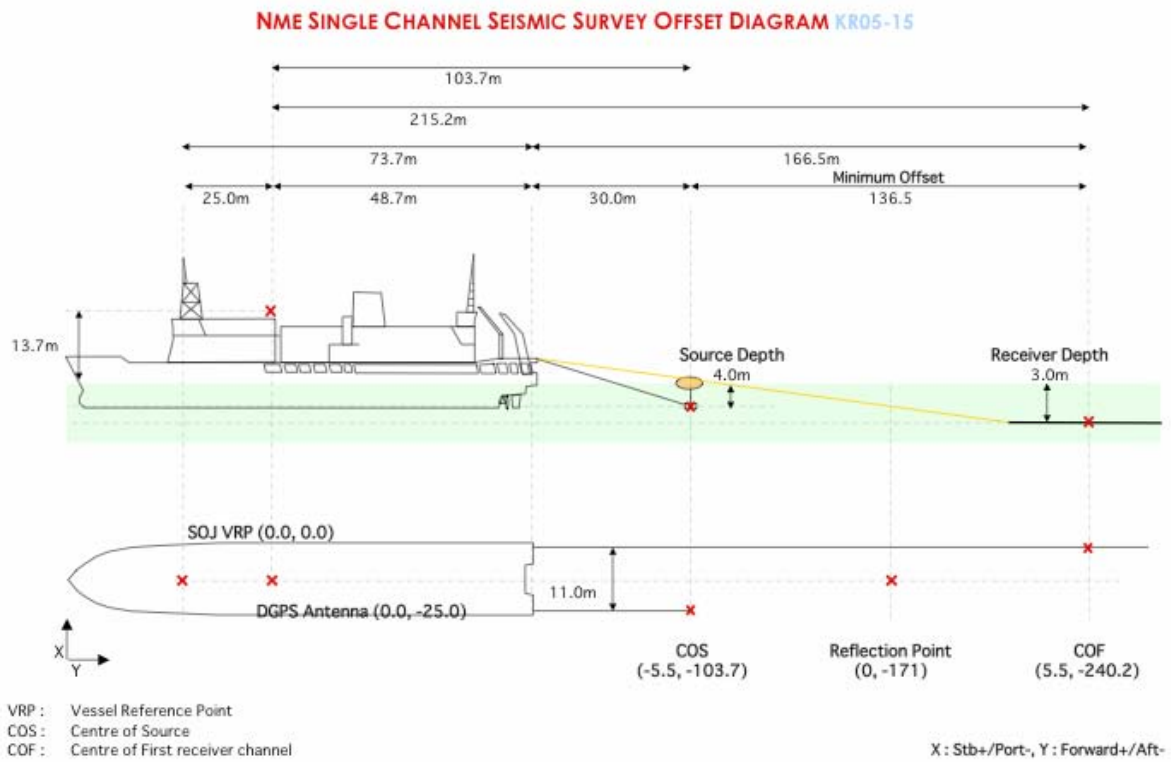


Figure 3.2-1 Geometry of single-channel seismic reflection observation in KR05-15 cruise.

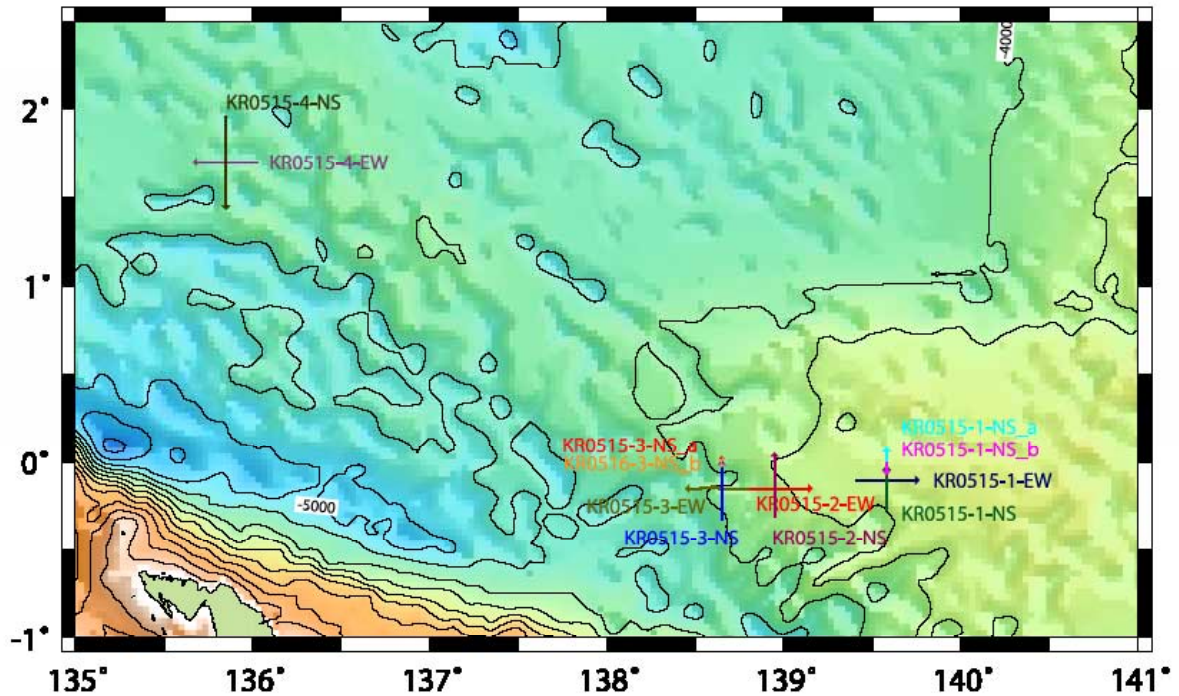


Figure 3.2-2 Location of single-channel seismic survey lines.

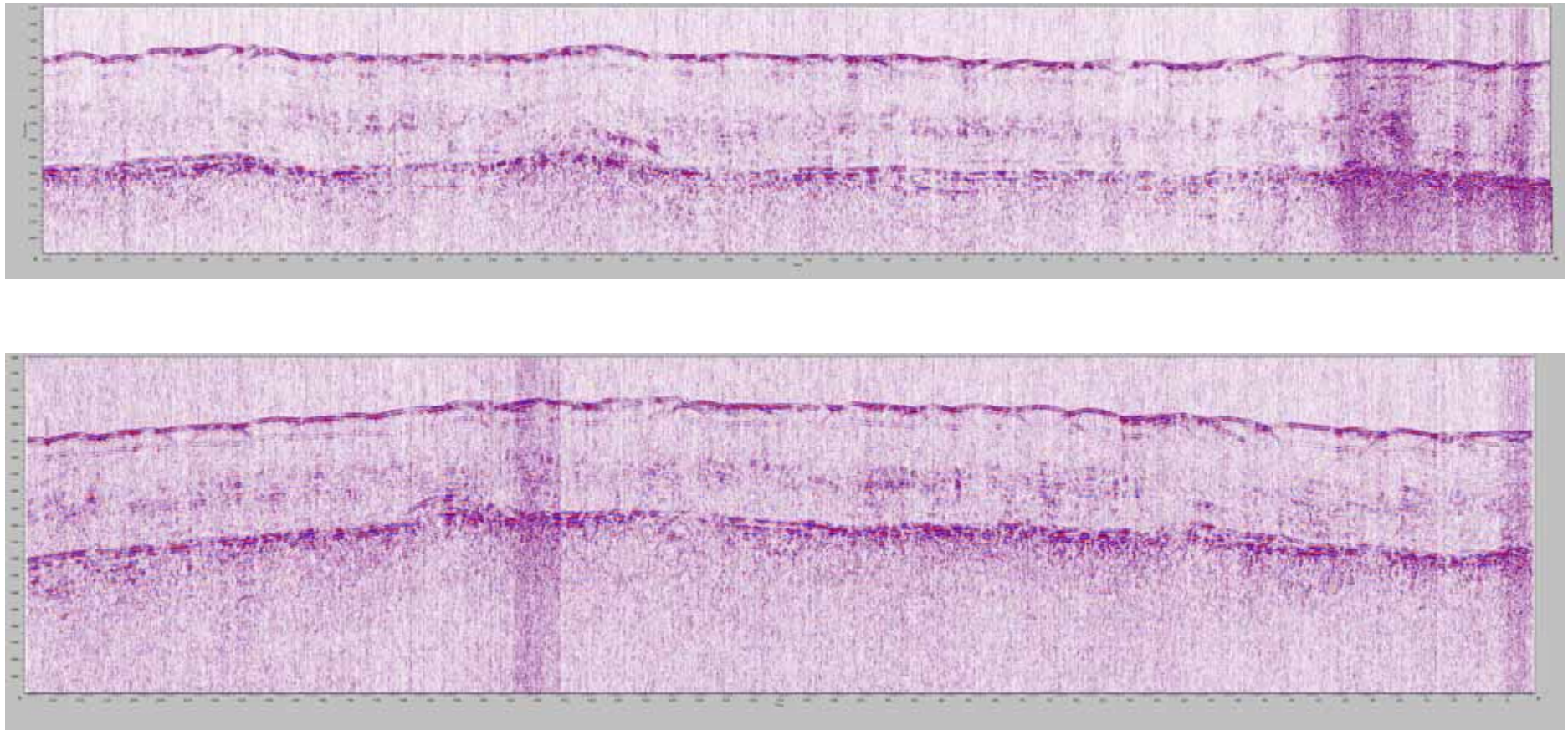


Figure 3-2.3 Seismic reflection profiles at site PC01. Upper panel: EW line (KR0515-1-EW), lower panel: NS line (KR0515-1-NS).

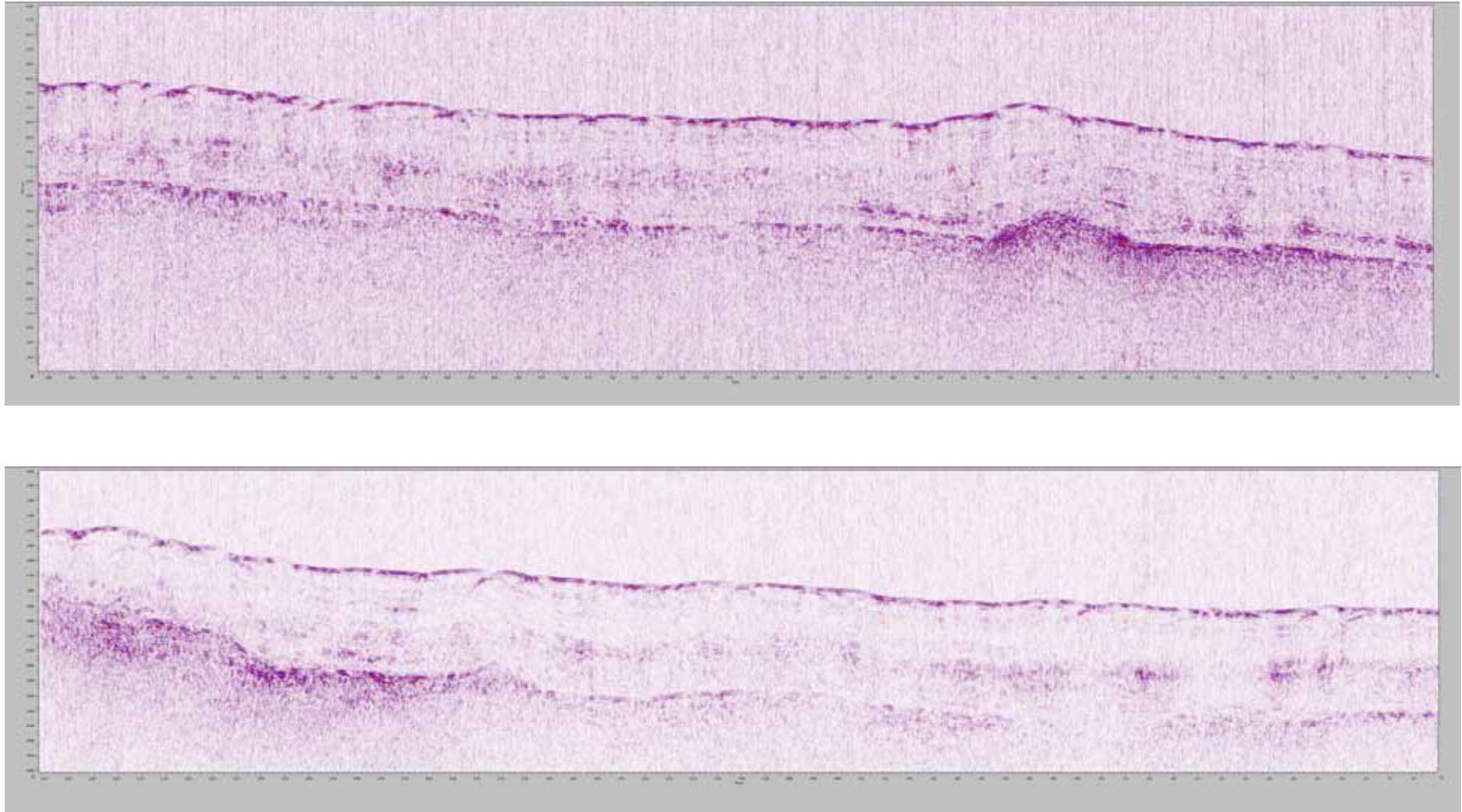


Figure 3-2.4 Seismic reflection profiles at site PC02. Upper panel: EW line (KR0515-2-EW), lower panel: NS line (KR0515-2-NS).

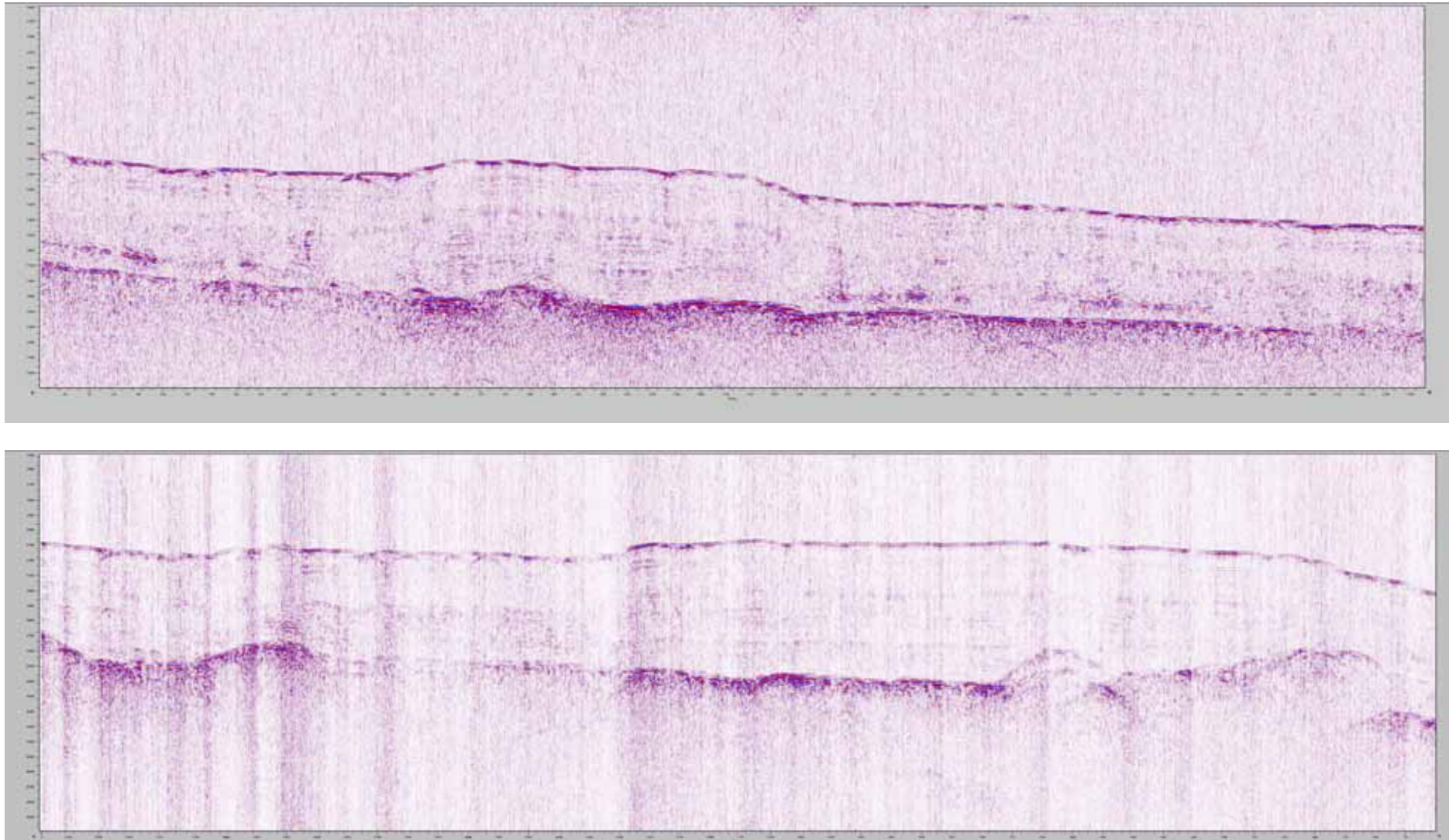


Figure 3-2.5 Seismic reflection profiles at site PC03. Upper panel: EW line (KR0515-3-EW), lower panel: NS line (KR0515-3-NS).

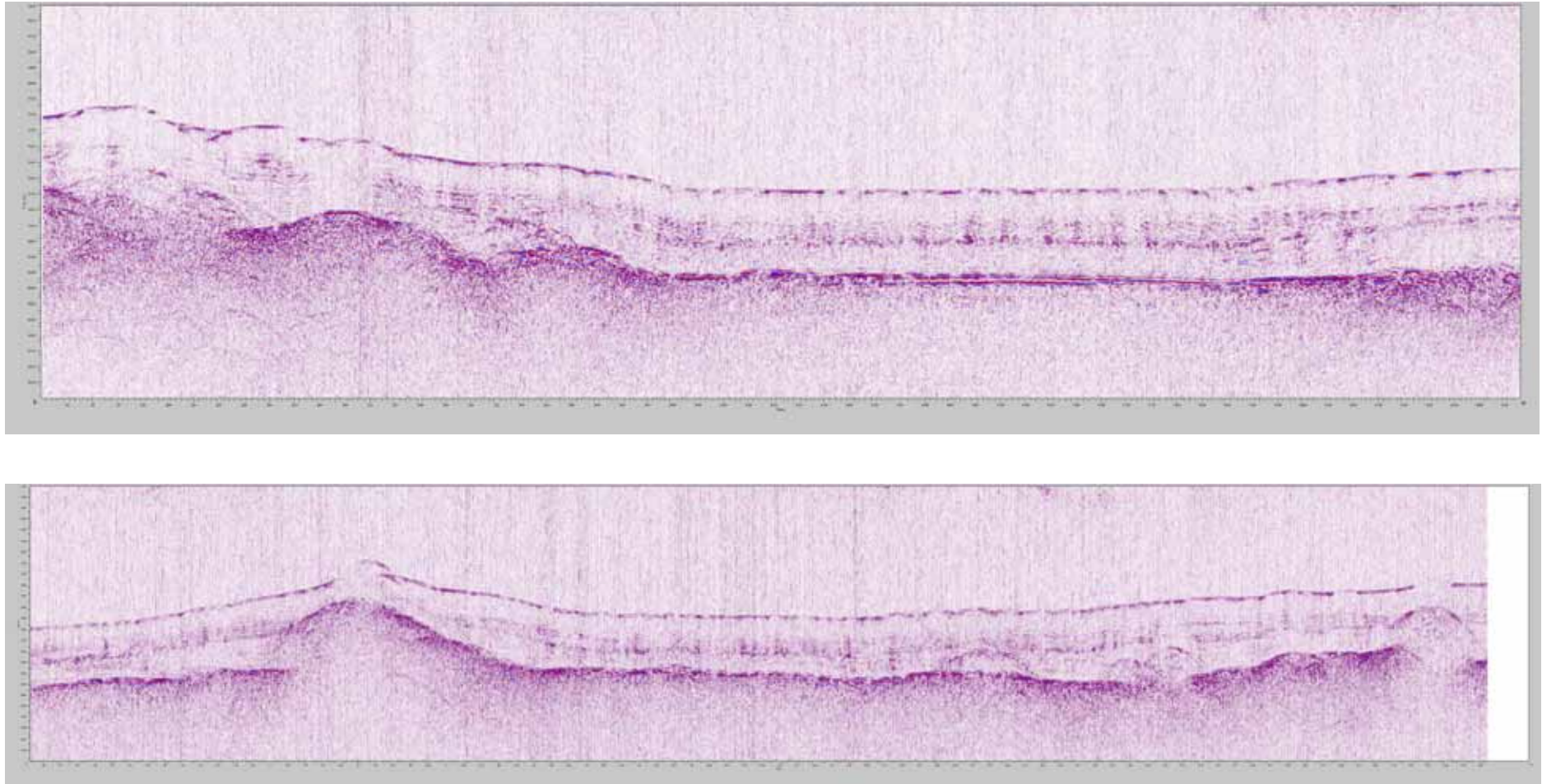


Figure 3-2.6 Seismic reflection profiles at site PC04. Upper panel: EW line (KR0515-4-EW), lower panel: NS line (KR0515-4-NS).

4. Piston coring

4.1 Summary

Piston coring was conducted at four sites. PC01, PC02 and PC03 belong to the southeastern survey area, and PC04 belongs to the western survey area. In the southeastern survey area, the coring sites were determined so as to take sediments from various depths above CCD. The site PC04 in the western survey area is close to the site WCB-1 of IODP proposal 612-Full2. The coring was successful, and high-quality long sediment cores were recovered. The result of the coring is summarized in Table 4-1.1

Table 4-1.1 Summary of piston coring.

| Core No. | Date and Time | Latitude | Longitude | Depth (m) | Core length (m)* | Lithology |
|----------|-----------------------|------------|--------------|-----------|------------------|------------------|
| PC01 | 2005.11.1 10:55:30 | 0°06.135'S | 139°34.969'E | 3,226 | 12.48 | Hemipelagic clay |
| PC02 | 2005.11.2 10:10:55 | 0°08.987'S | 138°56.969'E | 3,583 | 16.96 | Hemipelagic clay |
| PC03 | 2005.11.3 10:17:50 | 0°09.391'S | 138°38.956'E | 3,811 | 17.25 | Hemipelagic clay |
| PC04 | 2005.11.5 9:54:10 | 1°42.709'N | 135°50.866'E | 4,277 | 19.44 | Hemipelagic clay |

*excluded flow-in

4.2 Coring method and sample handling

A piston corer system used in this cruise consists of a long aluminum barrel with or without polycarbonate liner tube. The outline of the piston corer system is shown in Figure 4-2.1. The total weight of the system is approximately 1.5 ton. The length of the core barrel was 15m for PC01, and 20m for others. We used an Ewing-type pilot corer for a trigger. For PC01, we used inner liners (Inner type): polycarbonate liner tubes of 5 m long and 74mm inside diameter. For others, we didn't use inner liners (Outer type). A compass with an inclinometer was attached above the weight of the corer to examine performance of the corer.

When we started lowering the piston corer system, a speed of wire out was set to be 20 m/min., and then gradually increased to the maximum of 60 m/min. The piston corer was stopped at a depth about 100 m above the sea floor for about 5 minutes to reduce any pendulum motion of the system. After the system was stabilized, wire was paid out at a speed of 20 m/min., and we carefully watched a tension meter. When the piston corer touches the bottom, wire tension abruptly decreases by the loss of the piston corer weight. After the corer hit the bottom, three more meters of wire were paid out. Then, rewinding of the wire was started at a dead slow speed (10 m/min.), until the tension gauge indicated that the corer was lifted off the bottom. After leaving the bottom, wire was wound in at the maximum speed.

For PC01, the inner tubes of the piston corer filled with sediments were cut into 1m long for each section using a handy cutter. The sections were longitudinally split into a working and an archive halves using a splitting device and a fishing line. For PC02, 03, and 04, the aluminum barrels were cut into 1m long each using a band saw. The sediments of each section were extruded on a half vinyl chloride tube by a extrusion device. And then, the sediments were longitudinally split into a working and an archive halves.

On board, we carried out visual core description (on the working half), taking photographs (archive half), color reflectance measurement (archive half), and sub-sampling using plastic cubes of 7 cm³ each (working half). The samples were taken successively along two rows: one for paleomagnetism and another for isotope measurements.

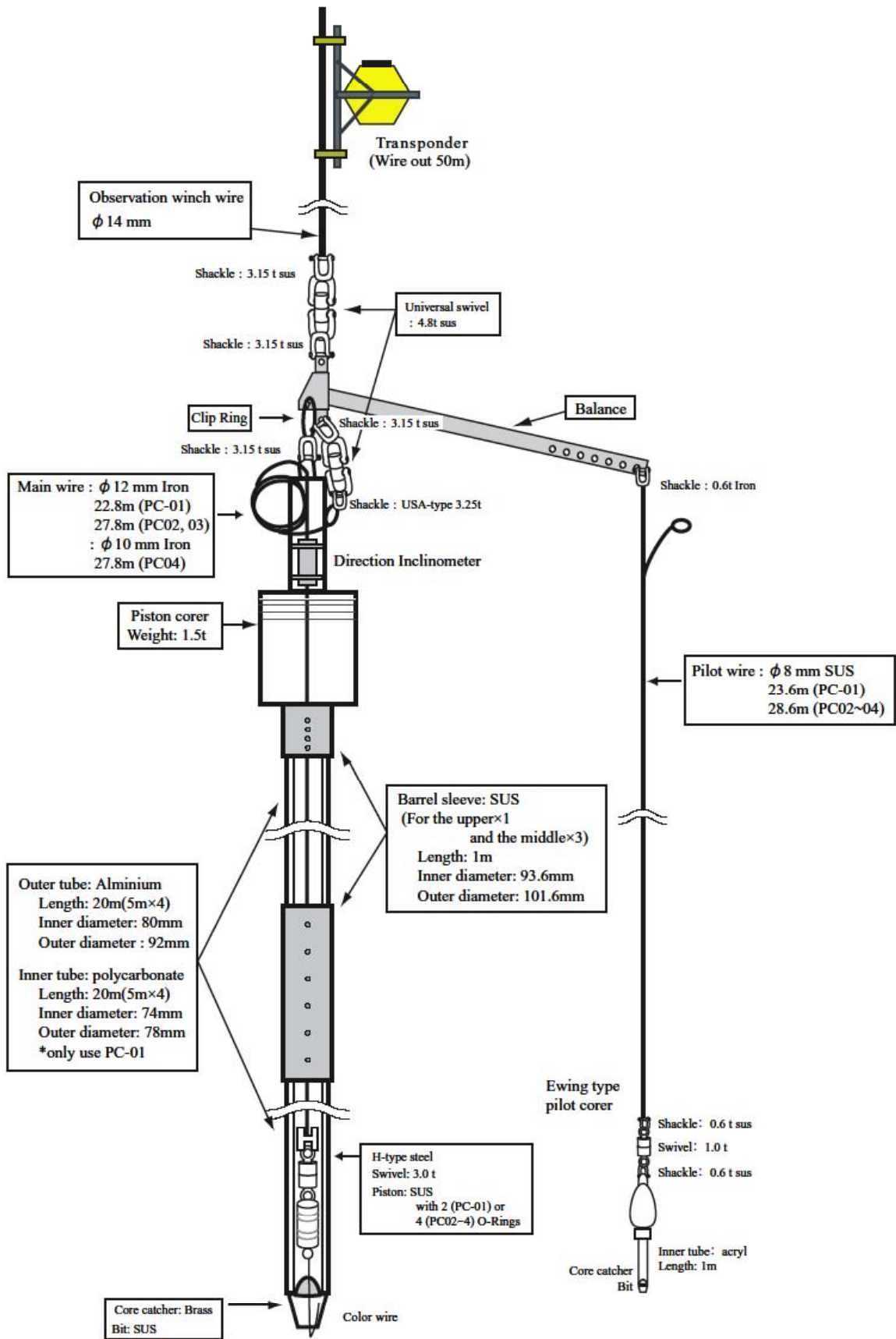


Figure 4-2.1 Diagram of piston corer system.

4.3 Visual core description and photograph

Visual core descriptions of the four sediment cores are presented in Appendix. Photographs of the cores are shown in Figures 4.3-1 through 4.3-4. The following is a brief summary of the description of each core.

Core PC01 consists of moderate to dark yellowish brown oxic clay (top 35 cm) and greenish gray hemipelagic clay with a large amount of visible foraminifera (below 35 cm). The sediments of the core PC1 are mottled and bioturbated, especially in the deeper part of the core. A large number of dusky green lithified layers and unclear dark gray layers occur throughout the core.

Core PC02 is composed of moderate yellowish brown or dark grayish orange oxide clay (top 42 cm) and greenish gray to dark greenish gray hemipelagic clay with a relatively large amount of visible foraminifera (below 42 cm). The sediments of the core PC2 are mottled and bioturbated relatively heavier than the core PC01. A large number of dusky green lithified layers and unclear dark gray layers occur throughout the core. A pumice occurs at 89 cm of the section 13, which is probably drifted pumice.

Core PC03 consists of moderate to dark yellowish brown oxide clay (top 60.5 cm) and hemipelagic clay with an amount of visible foraminifera (below 60.5 cm). The color of hemipelagic clay is generally changed from dark greenish gray to greenish gray with depth of the core. The sediments of the core PC03 are frequently mottled and bioturbated throughout the core. A large number of dusky green lithified layers and unclear dark gray layers occur throughout the core.

Core PC4 consists of moderate to dark yellowish brown clay with minor amount of foraminifera (top 51 cm) and dark greenish gray hemipelagic clay (below 51 cm). A thin fine-grain sand layer with normal grading occurs at 1357 cm of the core. The sediments of the core PC4 are frequently mottled and bioturbated throughout the core. A large number of dusky green lithified layers and unclear dark gray layers occur throughout the core.

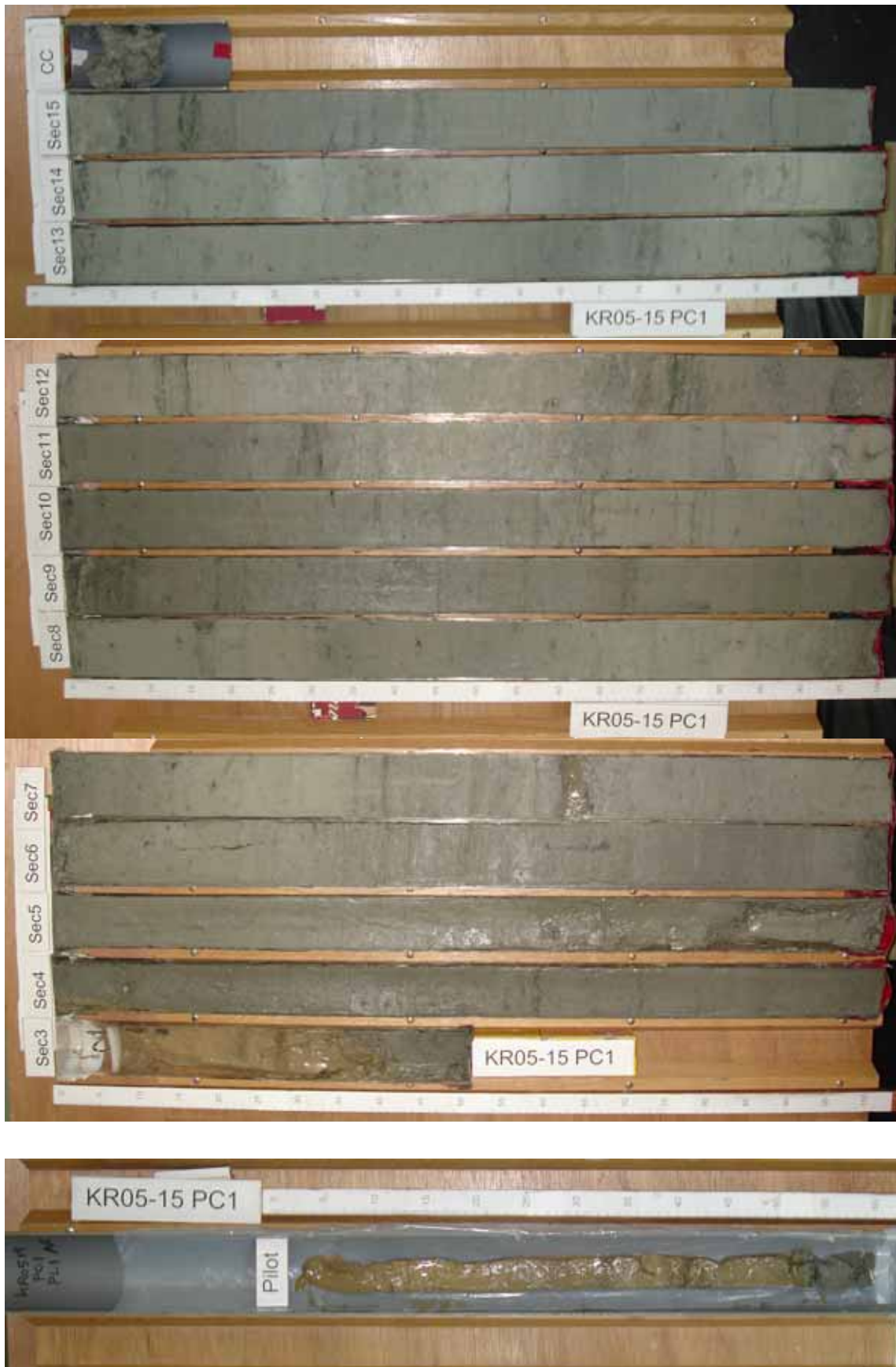


Figure 4-3.1 Photograph of core PC01.

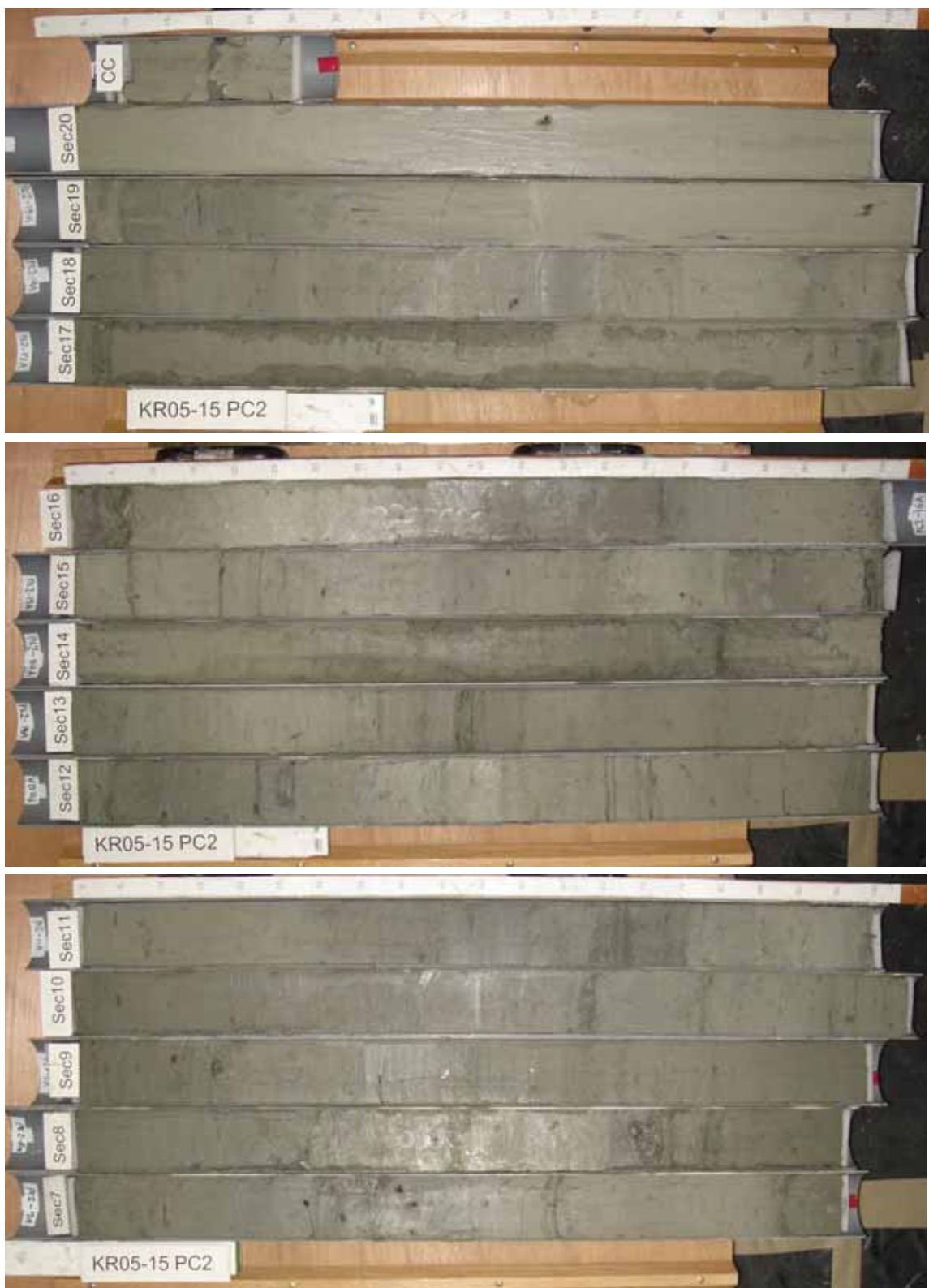


Figure 4-3.2 Photograph of core PC02 (section 7 to 20, and cc.).



Figure 4-3.2 (continued) Photograph of core PC02 (section 2 to 6, and PL02).



Figure 4-3.3 Photograph of core PC03 (section 7 to 20, and cc.).



Figure 4-3.3 (continued) Photograph of core PC03 (section 2 to 6, and PL03).

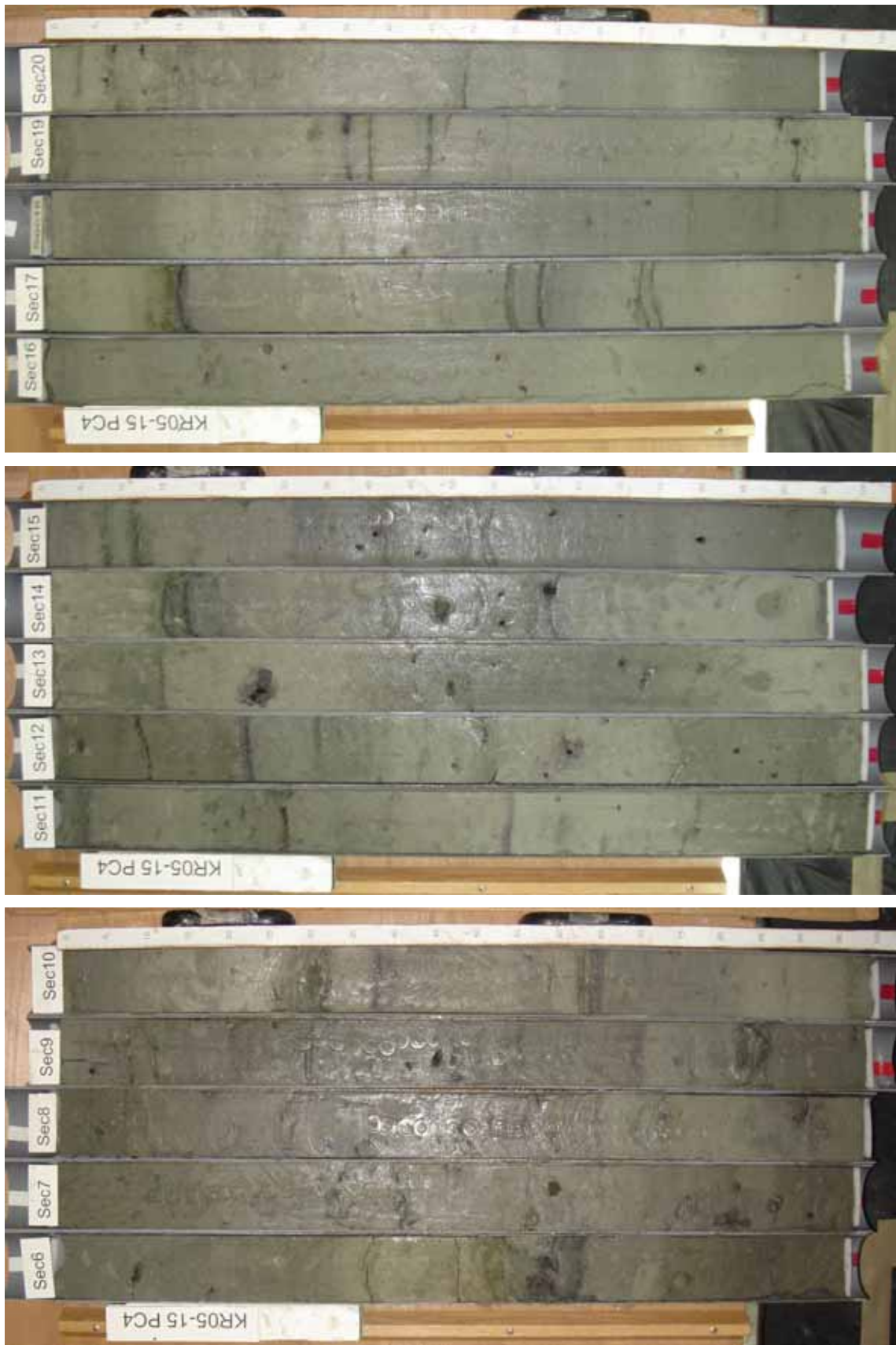


Figure 4-3.4 Photograph of core PC04 (section 6 to 20).



Figure 4-3.4 (continued) Photograph of core PC04 (section 1 to 5, cc., and PL04).

4.4 Color reflectance

Color reflectance was measured using the Minolta Photospectrometer CM-2002. The split surface of archive halves was measured on every 2 cm through crystal clear polyethylene wrap. The color reflectance data are displayed as color parameters L^* , a^* , and b^* (L^* : black and white, a^* : red and green, b^* : yellow and blue). The results are presented in Figures 4.4-1 through 4.4-8.

For all cores, the several tens of centimeters from the top are generally characterized by high a^* and b^* . The L^* values fluctuate throughout the cores. The variation patterns in L^* , a^* , and b^* between PL01 and PC01, PL02 and PC02, PL04 and PC04 show consistency, which suggests the good recovery of surface sediments by the piston corer.

The plots of PL03 show a duplicated pattern (0-50 cm and 50-62 cm) (Figure 4.4-6). This suggests that pilot core PL03 hit the bottom twice. On the other hand, the variation pattern of PC03 is similar to that of other cores. It is hence considered that PC03 was normally recovered.

The variation pattern of L^* is quite similar among the cores from the southeastern survey area (PC01, PC02, and PC03), and these cores can be correlated by L^* . For example, tentative visual inspection suggests that 11.5m of PC01, 15m of PC02, and 16.5m of PC03 can be correlated with each other. The pattern of PC04 is somewhat different from others, but seems to be still correlative. The low of L^* at 13.5m of PC04 may correspond to the above mentioned horizons of other cores.

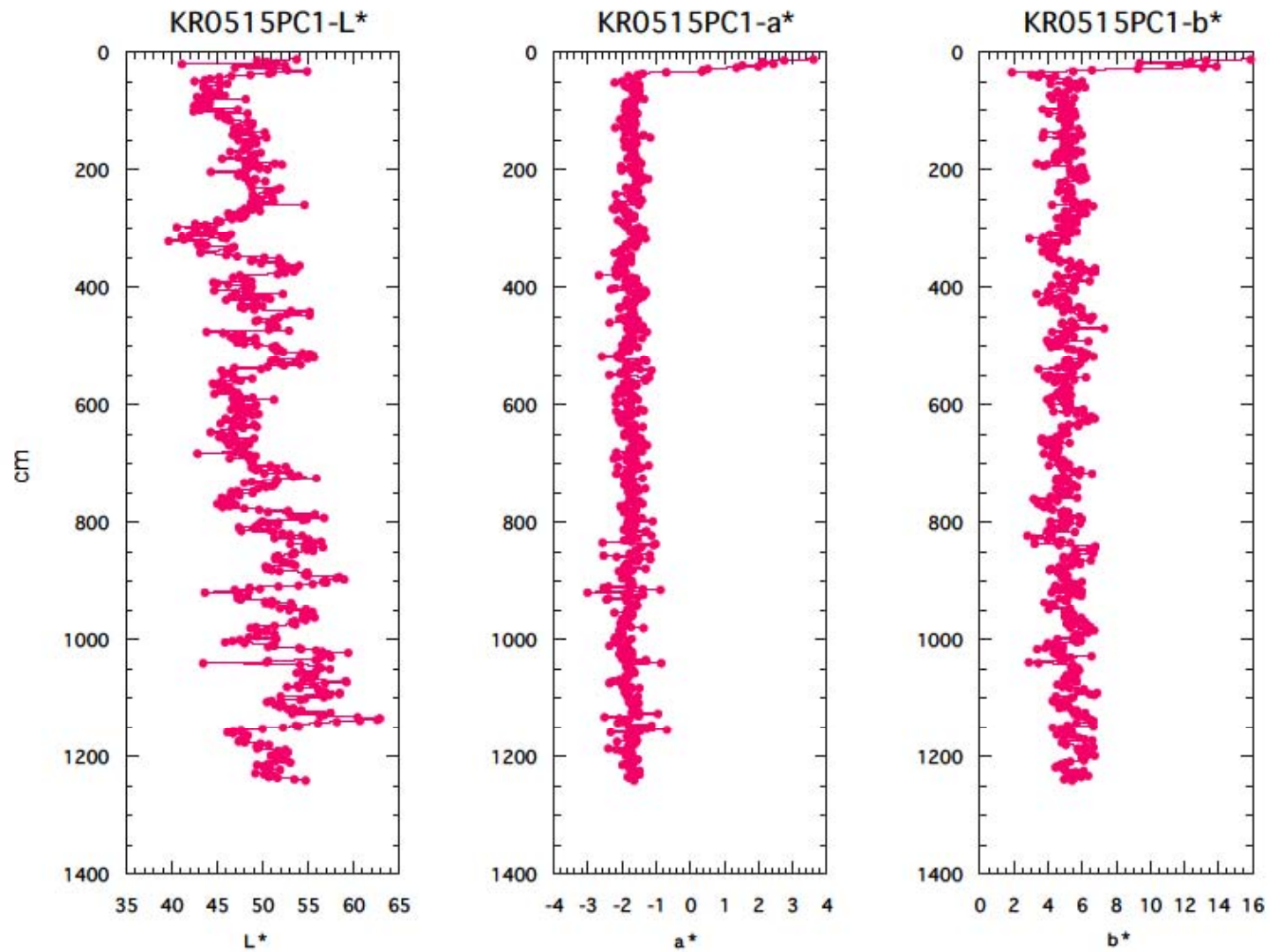


Figure 4.4-1 Color reflectance (L^* , a^* , b^*) of KR0515-PC01.

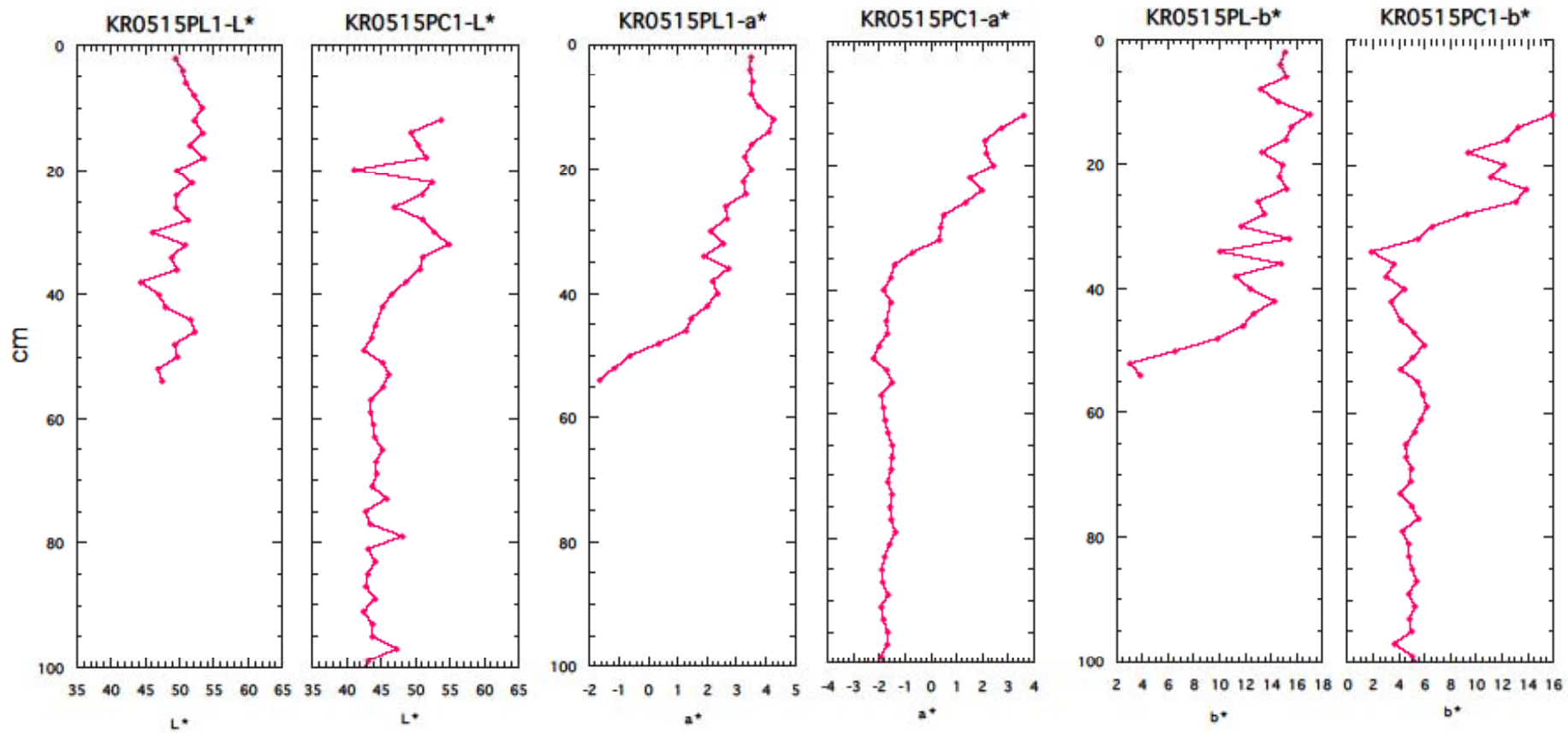


Figure 4.4-2 Comparison of color reflectance (L^* , a^* , b^*) of pilot core PL01 and the uppermost part of piston core PC01.

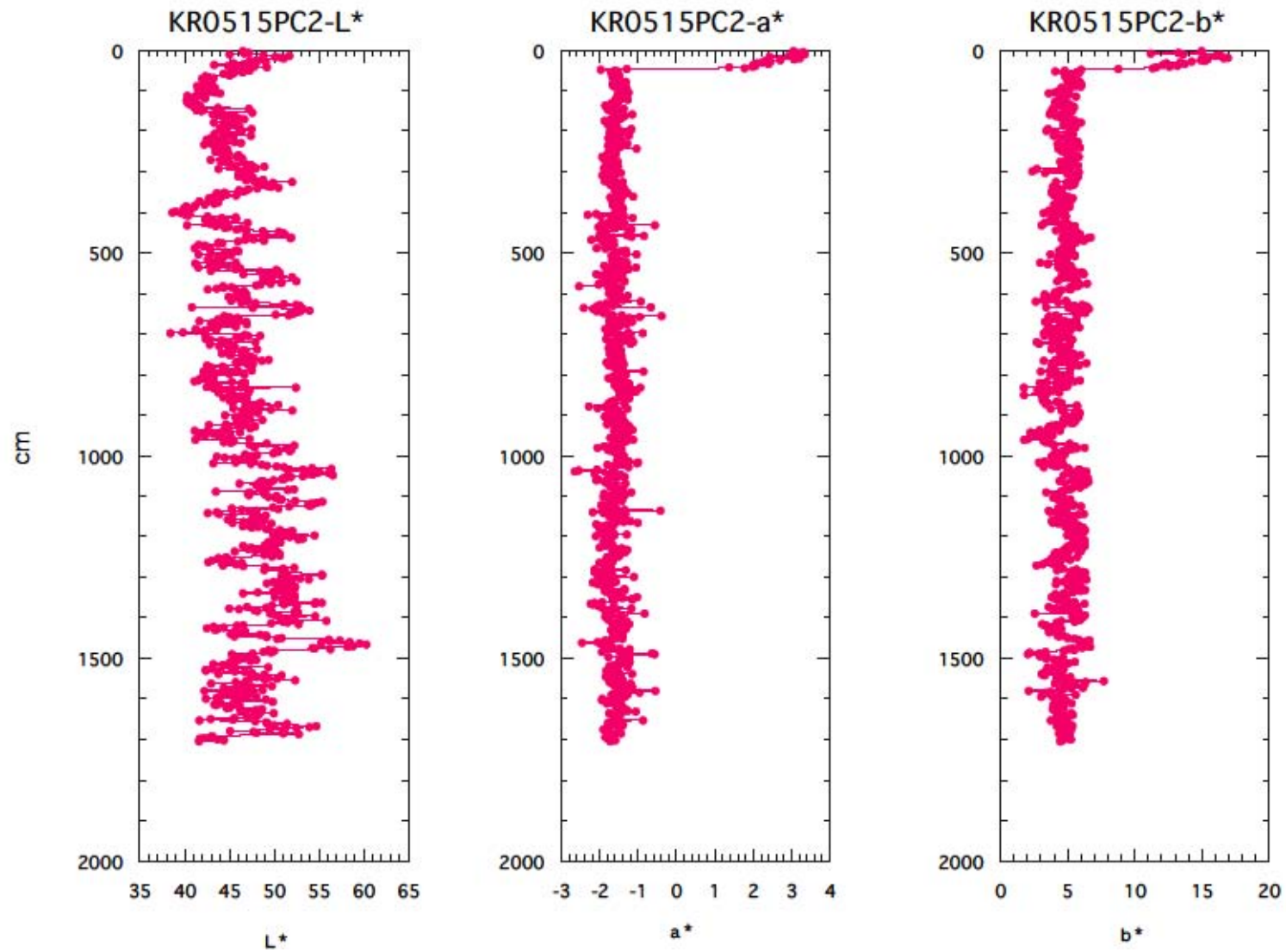


Figure 4.4-3 Color reflectance (L^* , a^* , b^*) of KR0515-PC02.

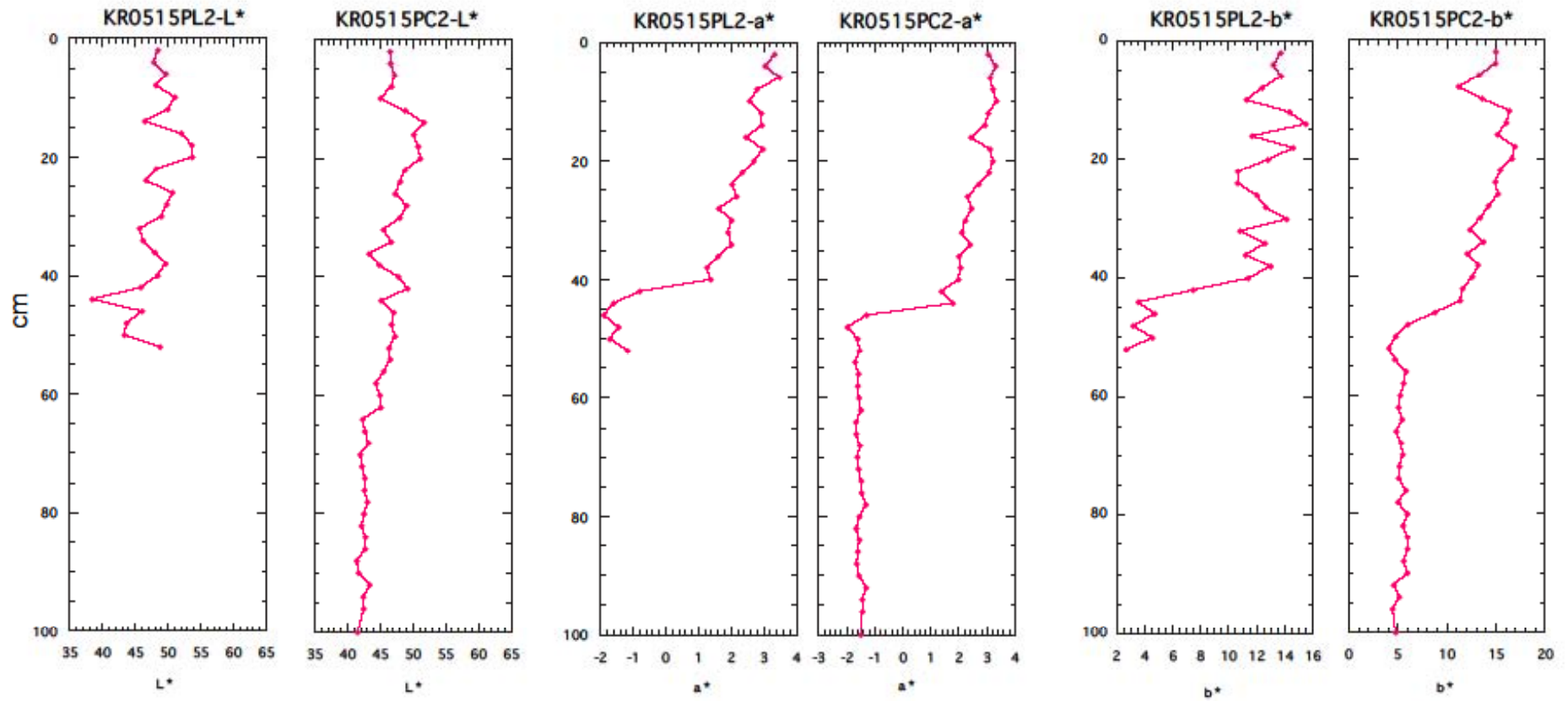


Figure 4.4-4 Comparison of color reflectance (L^* , a^* , b^*) of pilot core PL02 and the uppermost part of piston core PC02.

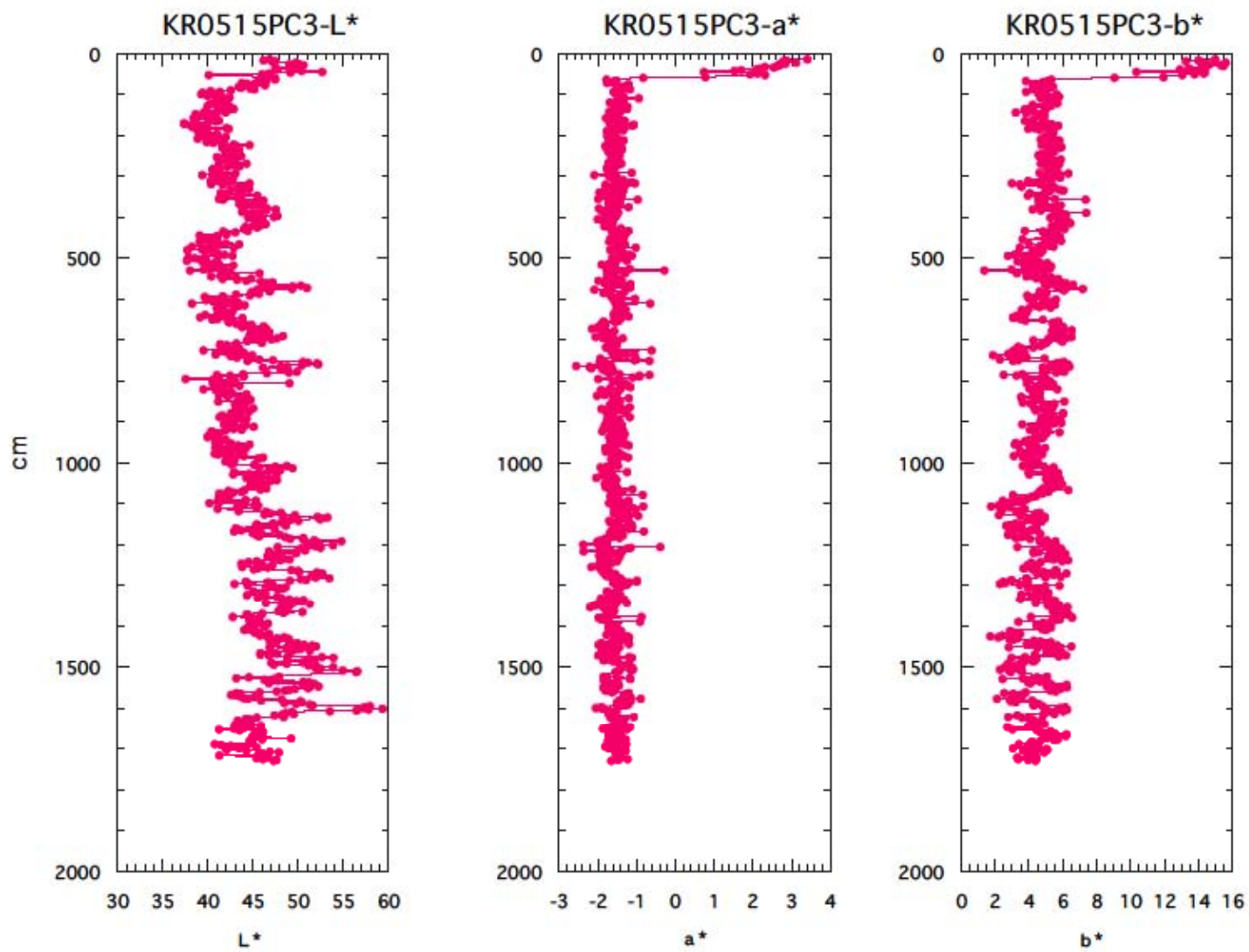


Figure 4.4-5 Color reflectance (L^* , a^* , b^*) of KR0515-PC03.

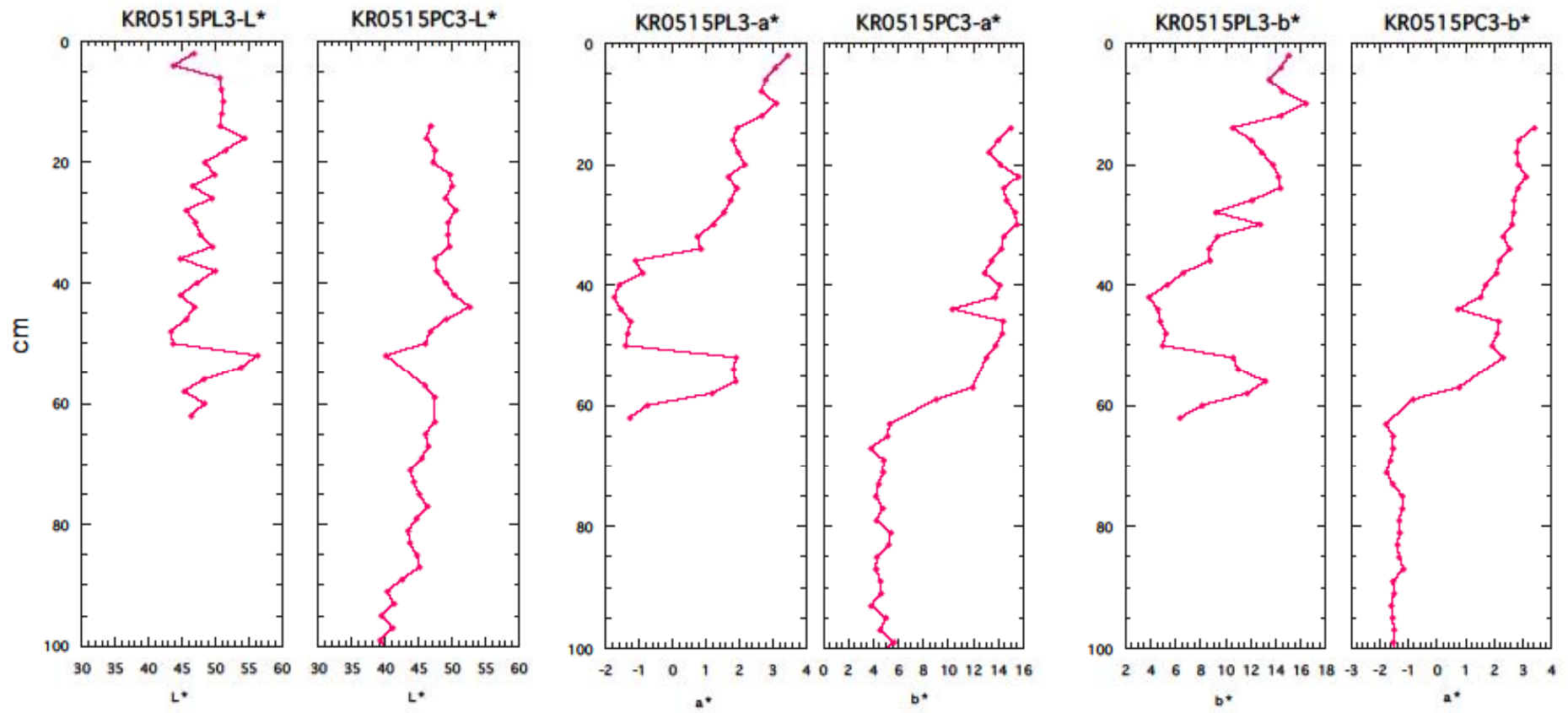


Figure 4.4-6 Comparison of color reflectance (L^* , a^* , b^*) of pilot core PL03 and the uppermost part of piston core PC03.

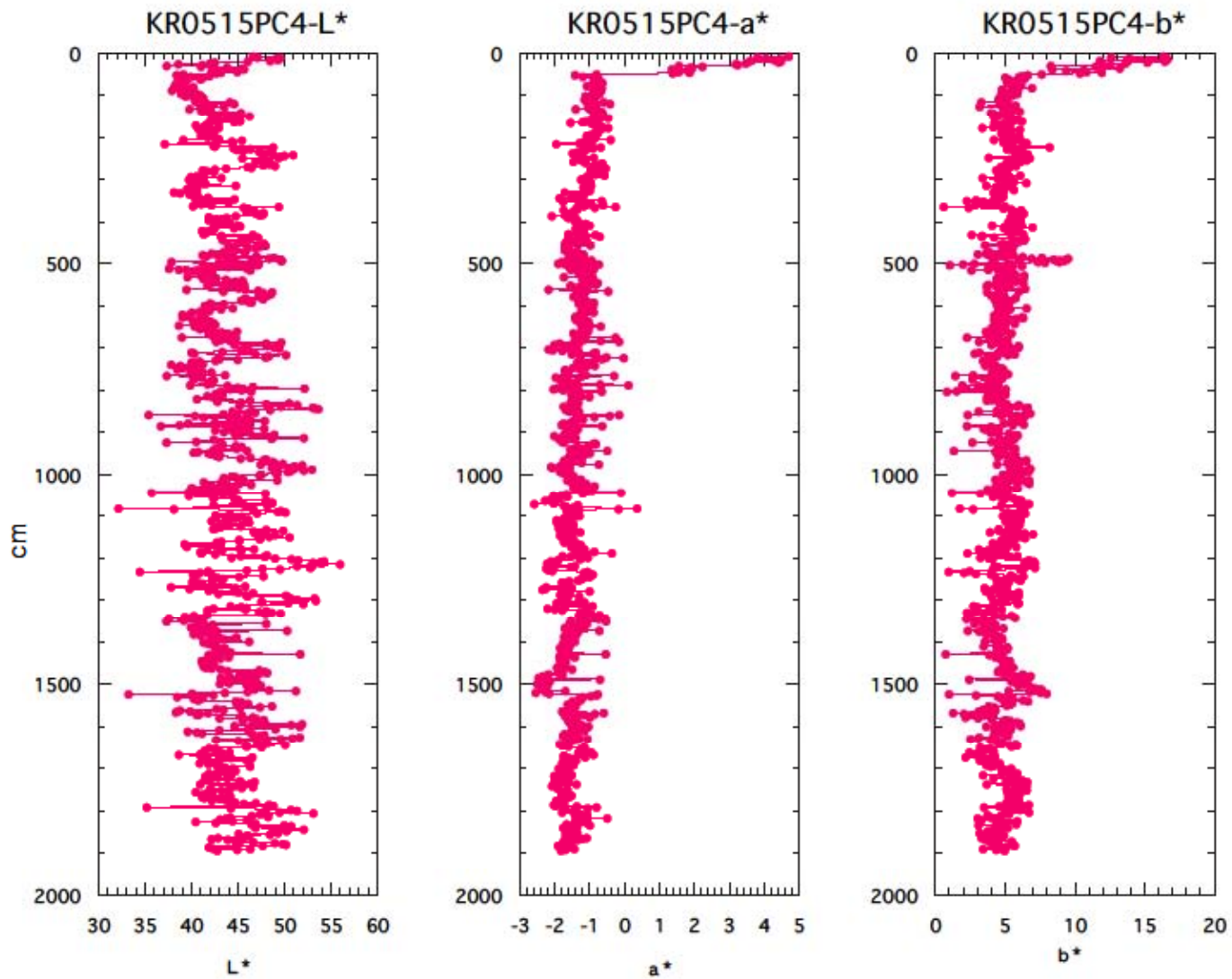


Figure 4.4-7 Color reflectance (L^* , a^* , b^*) of KR0515-PC04.

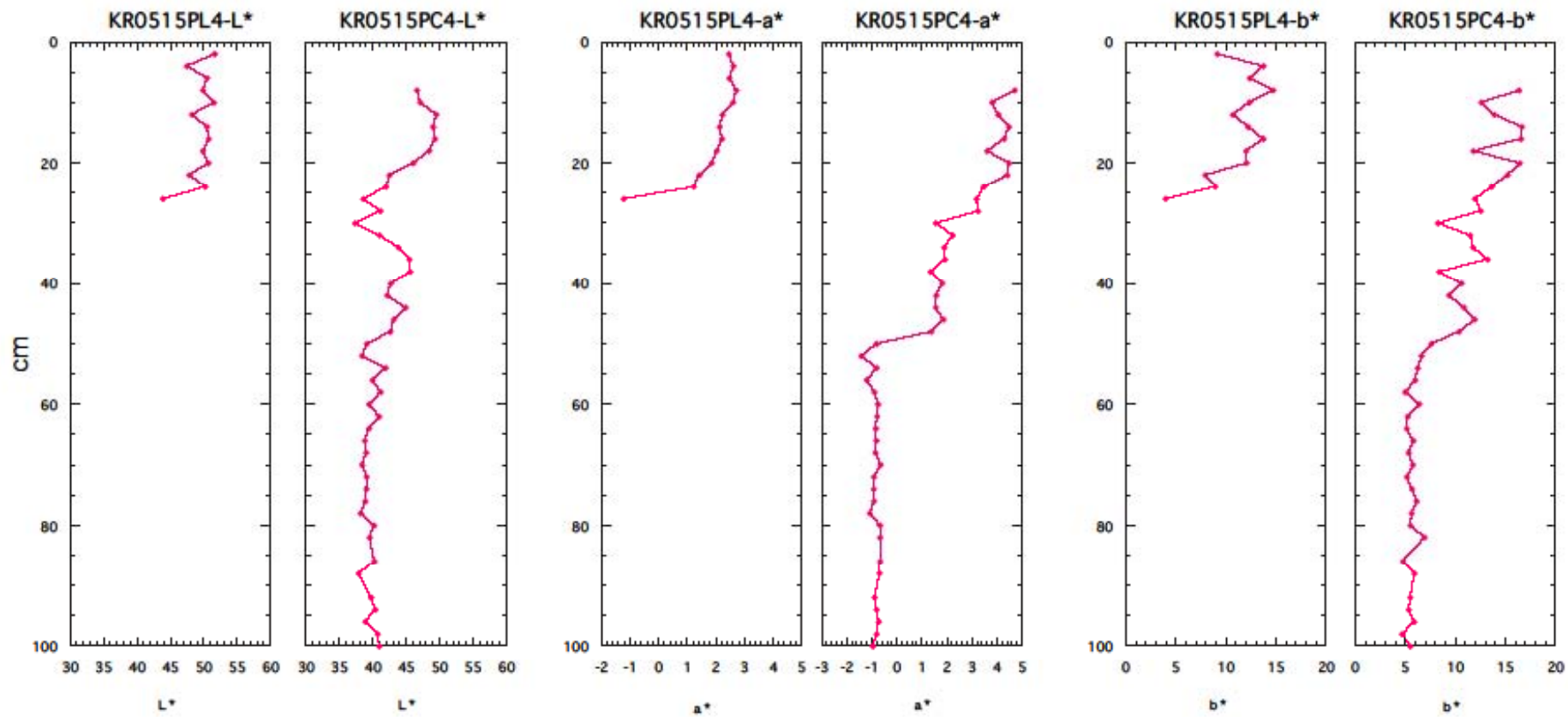


Figure 4.4-8 Comparison of color reflectance (L*, a*, b*) of pilot core PL04 and the uppermost part of piston core PC04.

4.5 Future studies

Paleomagnetic and rock-magnetic measurements of the sediment cores will be carried out at the Geological Survey of Japan, JAMSTEC, and Kochi University in cooperation with LIPI (Indonesian Institute of Sciences). Oxygen isotope measurement will be conducted at the Geological Survey of Japan. These data and site survey data (topography, sub-bottom profiles, and single-channel seismic profiles) will be utilized to revise the IODP proposal 612-Full2. Also the results will be published in international journals.

| | | | |
|----|-----------------------|--------|---------------------|
| ☆ | Gravel | ? | Mottled |
| ⊙ | Sand spot or patch | ⊖ | Burrow |
| ⊕ | Scoria spot | ↑ | Fining upward |
| Ⓐ | Pumice or ash spot | LLLLL | Partially lithified |
| Py | Pyrite nodule | PPPPPP | Porous layer |
| ● | Black spot | HHHHH | Hard layer |
| ■ | Greenish band or spot | ○ ○ ○ | Soupy |
| ■ | Wood fragment | ≡≡≡ | Disturbed |
| ♣ | Shell fragment | ✓ | Volcanic ash |
| * | Sponge spicules | | |
| ? | Brown gelly material | | |

KR05-15

Date: 11/1 2005

CORE: PC1 Sec.3

by: Ryanma.

| | lithology | Structure | Color | Sampling | Description | | |
|-----------|-----------|-----------|-------|---------------|---|--|--|
| 0 | | | | 1901 (4cm) | 0-19 Moderate yellowish brown to tan rich ooze | | |
| 10 | | | | 10YR 5/4 | | | |
| 20 | | | | SSS | 10YR 9/2 | 19-20 Dark yellowish brown ooze | |
| | | | | SS | 10YR 5/4 | 20-23 moderate yellowish brown with forams. | |
| | | | | | 10YR 9/2 | 23-24.3 Dark yellowish brown ooze. | |
| | | | | SS | | 24.5-31 moderate yellowish brown ooze with forams | |
| 30 | | | | ZZZ | | 1913 | 31-33 Disturbed |
| | | | | | | 1915 | 35-47 Grayish blue green clay with few forams |
| 40 | | | | | | 5Bg 5/2 | |
| 50 | | | | | | 1919 | |
| 60 | | | | | | | |
| 70 | | | | | | | |
| 80 | | | | | | | |
| 90 | | | | | | | |
| 100 | | | | | | | |
| 110 cm | | | | | | | |

total length 47 cm

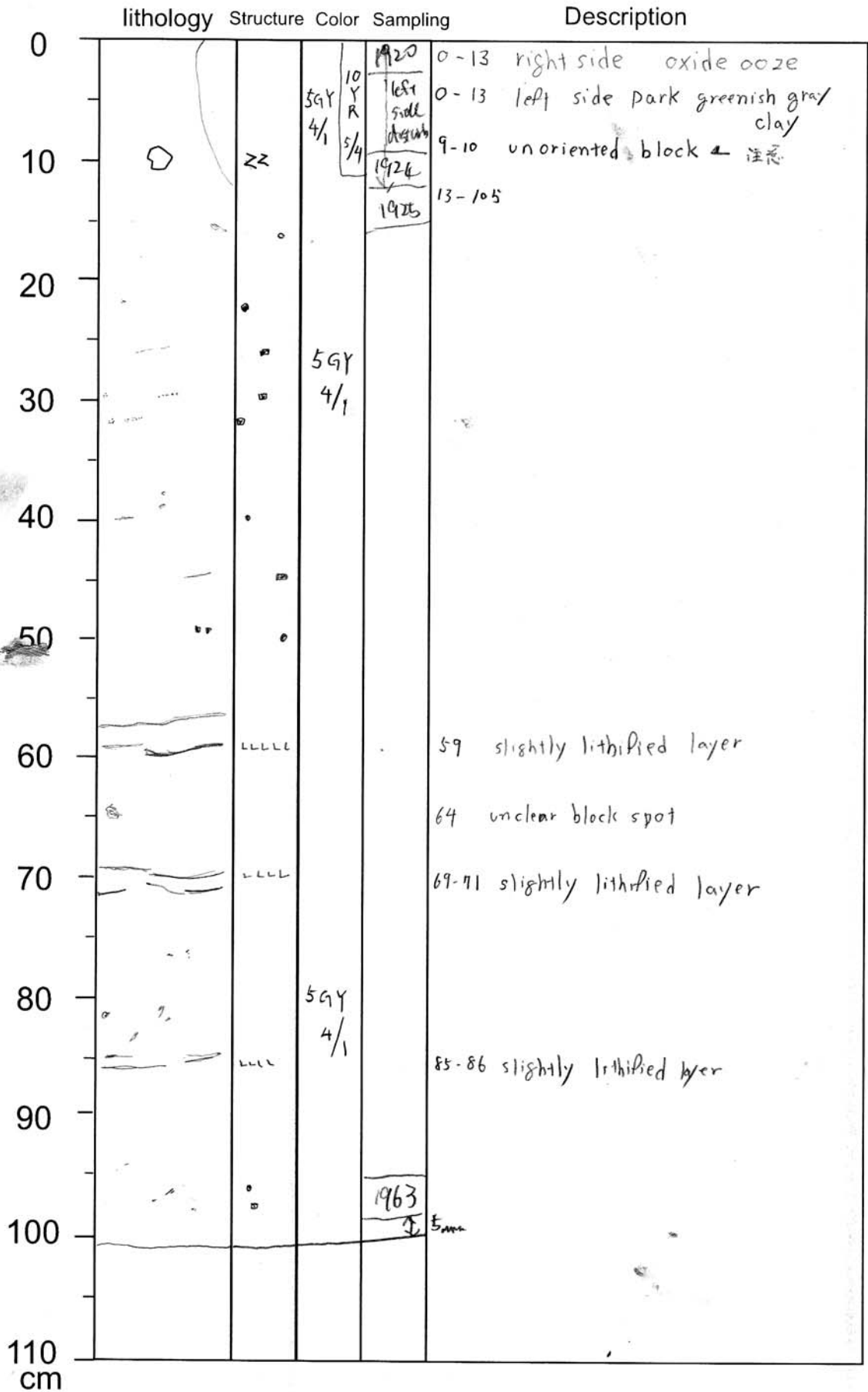
section length 47 cm

KR05-15

Date: 11/1 2005

CORE: Pol sec 4

by: Suganuma.



total length

section length

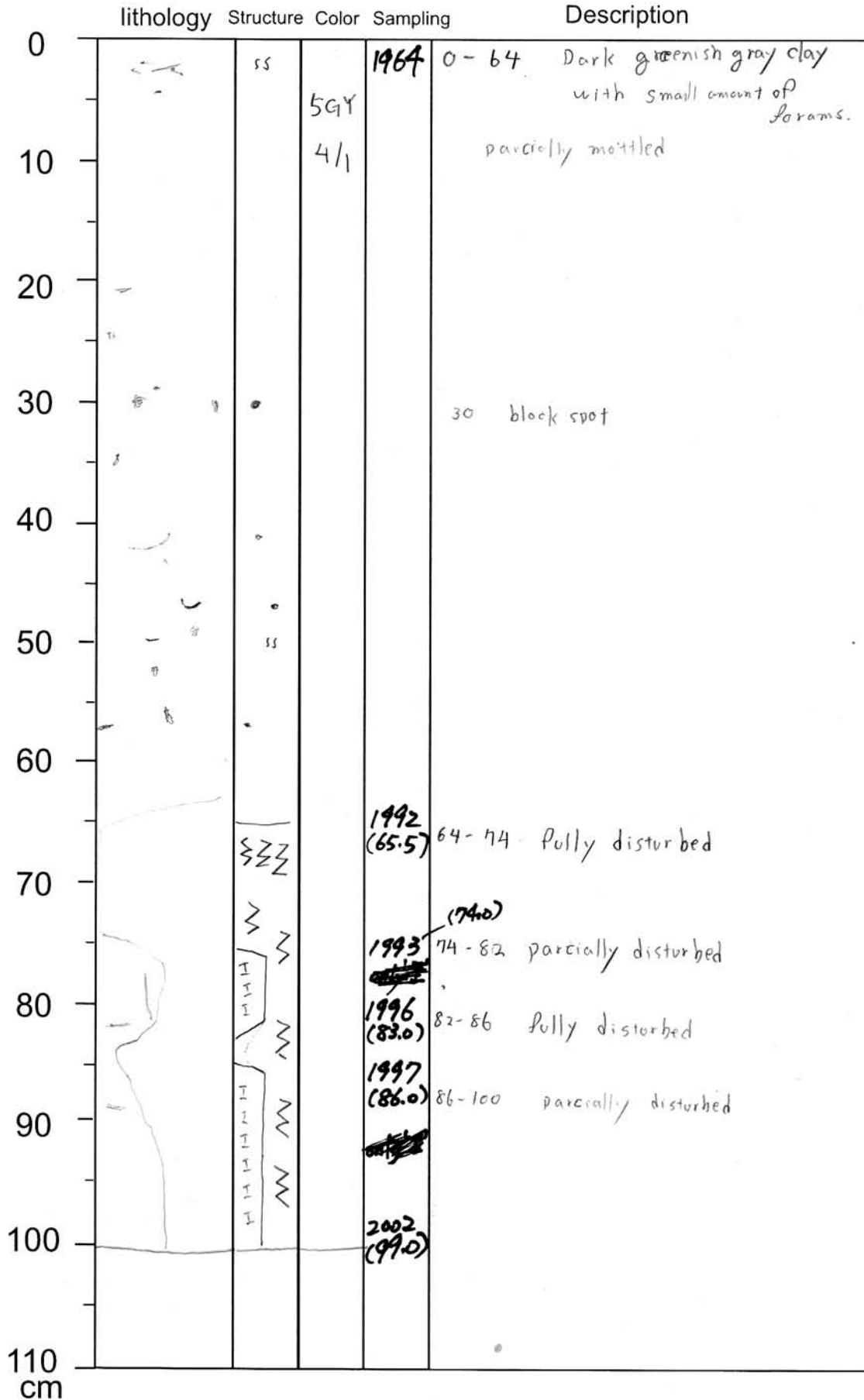
100.5 cm

KR05-15

Date: 11/1 8/2005

CORE: Pc1 sec.5

by: Suganuma



total length _____

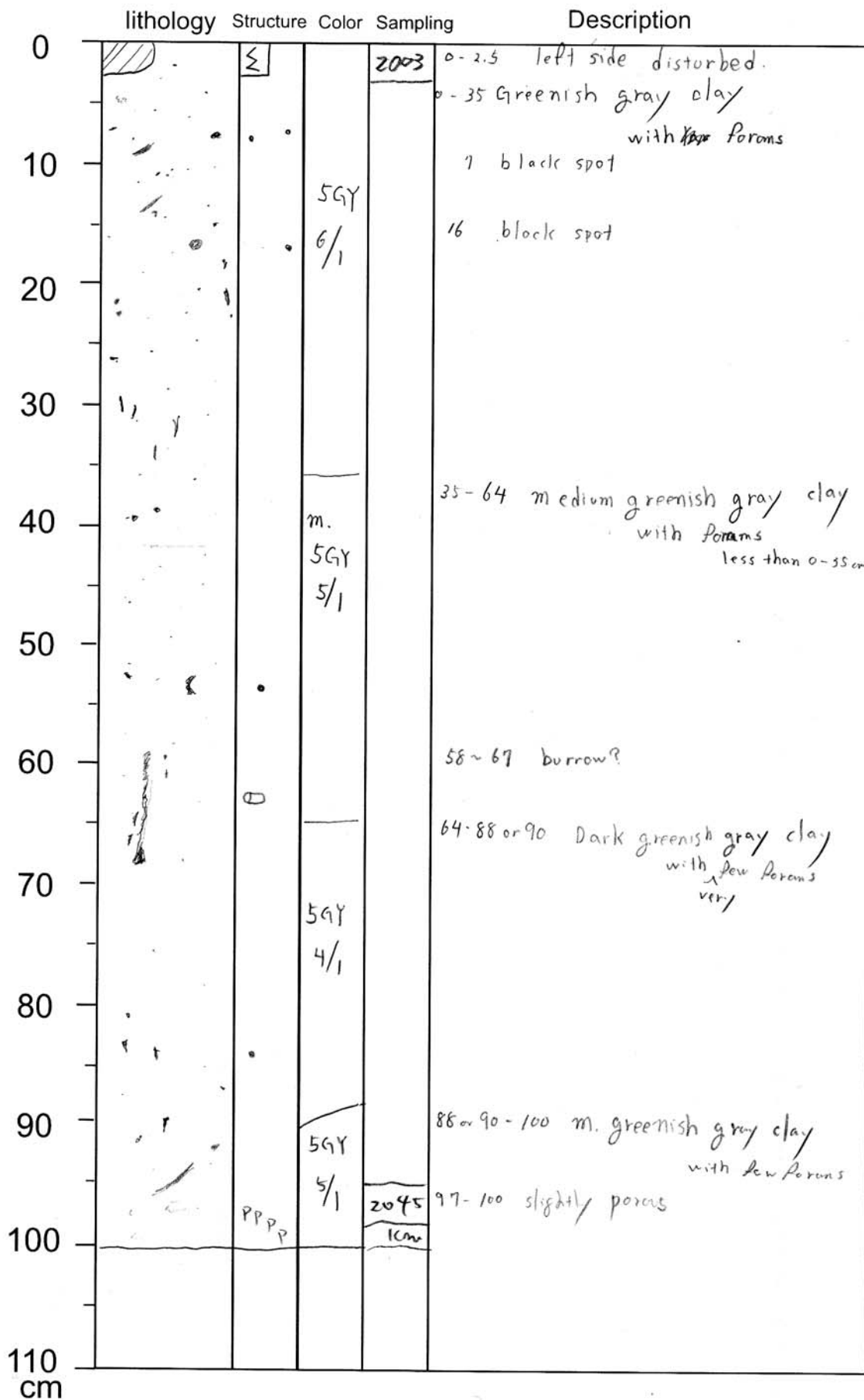
section length 100.0

KR05-15

Date: 11/1 2005

CORE: PC1 sec. 6

by: Suganoma



total length

section length

100

KR05-15

Date: 11/1 2005

CORE: Pcl sec 7

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|------------|-------|----------|--|
| 0 | | P P P | 5GY | 2046 | 0-13 Dark greenish gray clay m. with few forams |
| 10 | | | | | 13-38 green gray clay with forams 13-22 burrows and mottled |
| 20 | | SS SS | 6/1 | | |
| 30 | | | | | |
| 40 | | | | | |
| 40 | | LLLL SS | 5GY | | 38-60.5 m. greenish gray clay with minor forams |
| 50 | | | | | 40-48 burrows |
| 55 | | | | | 52, 54 black spot |
| 60 | | | | | |
| 60 | | SSS | | 2071 | 60.5-62.5 disturbed |
| 65 | | | | | 2072 |
| 70 | | SS | 5GY | | |
| 80 | | | | | |
| 90 | | | | | |
| 90 | | SS | 6/1 | 2087 | 85-100 Greenish gray clay with forams minor |
| 100 | | | | | 95-99 burrows |
| 110 | | | | | |

Be sure!!
→

total length _____ section length 100.

KR05-15

Date: 11/1 2005

CORE: PC / sec. 8

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-------------|-------|---|---|
| 0 | | | | 2088 | 0-32 m. greenish gray clay with forams |
| 10 | | SS | 5GY | 5/1 | 5 black spot |
| 20 | | LLLL LLL | | | 13-14 mottled. |
| 30 | | SS | | | 16-18 Lithified |
| 40 | | | 5GY | 4/1 | 20-22 black spot |
| 50 | | | | | 30-32 mottled |
| 60 | | | 5GY | 5/1 | 32-55 Dark greenish gray clay with minor forams |
| 70 | | | 5GY | 6/1 | 42 Black matter |
| 80 | | | | | 48-52 burrow |
| 90 | | | 5GY | 5/1 | 55-62 m. greenish gray clay with forams |
| 100 | | | | | 58 black spot |
| 110 | | | | | 62-92 foram rich greenish gray clay |
| | | | | | 64-65 burrow |
| | | | | | 79-81 burrow |
| | | | | | 81,2 black spot |
| | | | 5GY | 5/1 | 92-100 m. greenish gray clay |
| | | | | 2130 (99.5) cm | |

total length

section length

100.

KR05-15

Date: 11/1 2005

CORE: Pc1 sec. 9

by: Suganuma.

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|---------------|------------|----------|---|
| 0 | | LLL | | 2131 | 0-100 Dark greenish gray clay |
| 10 | | LLL LLL | 5GY 4/1 | | 0-8 lithified layers 0-45 minor forams |
| 20 | | LLLLL LLLL | | | 18, 21.5 lithified layer |
| 30 | | Ø | 5GY 4/1 | | 29-30 burrow |
| 40 | | | | | 45-55 foram |
| 50 | | | 5GY 4/1 | | 50 black spot 55-63 many forams |
| 60 | | | | | |
| 70 | | LLL | 5GY 4/1 | | 69.5 lithified layer 72-88 burrow? |
| 80 | | | | | 83 black spot |
| 90 | | Ø | | | 90 burrows |
| 100 | | | | 2174 | |
| 110 | | | | | |

total length _____

section length _____

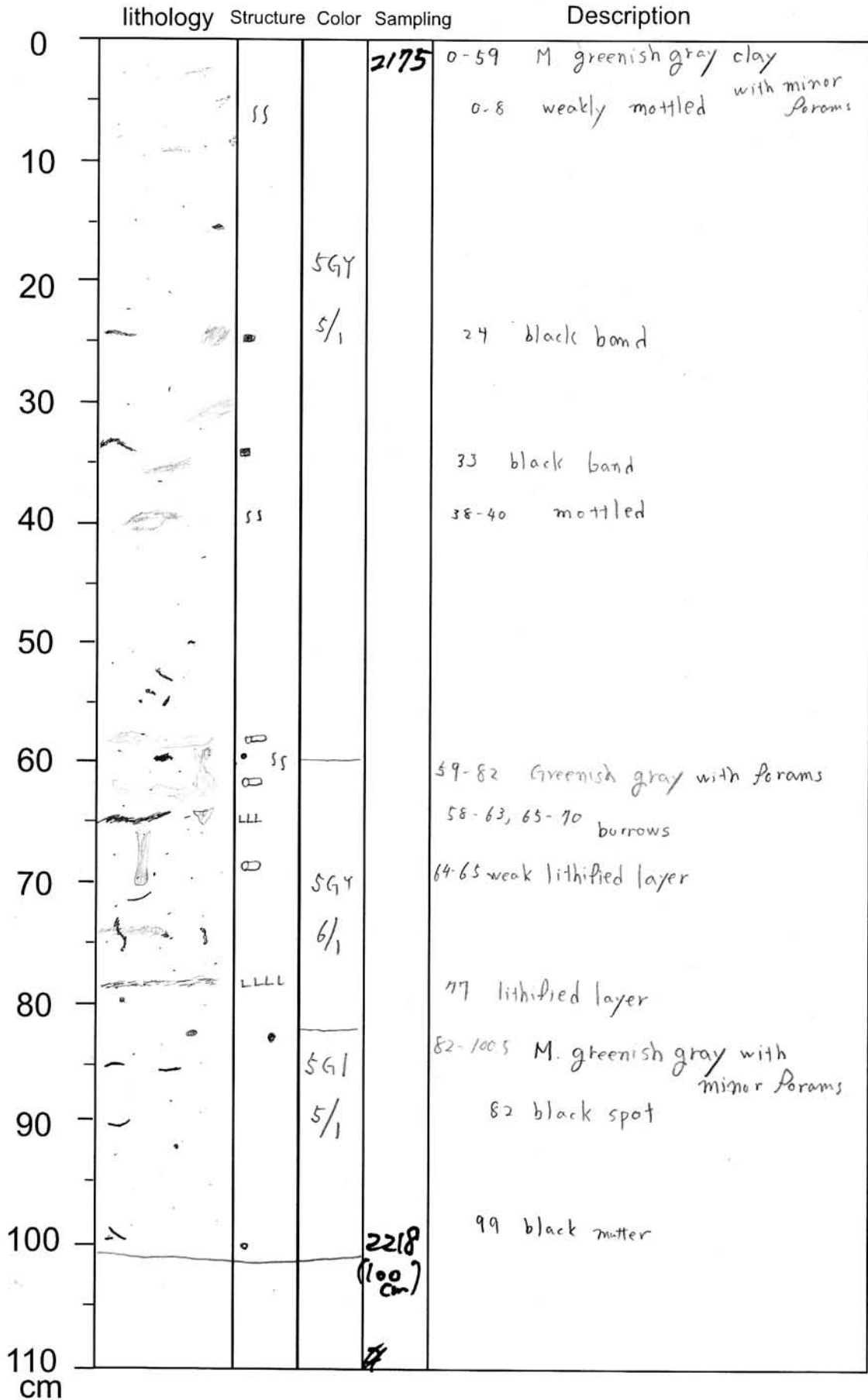
100

KR05-15

Date: 11/2 2005

CORE: P01 sec. 10

by: Suganuma



total length

section length

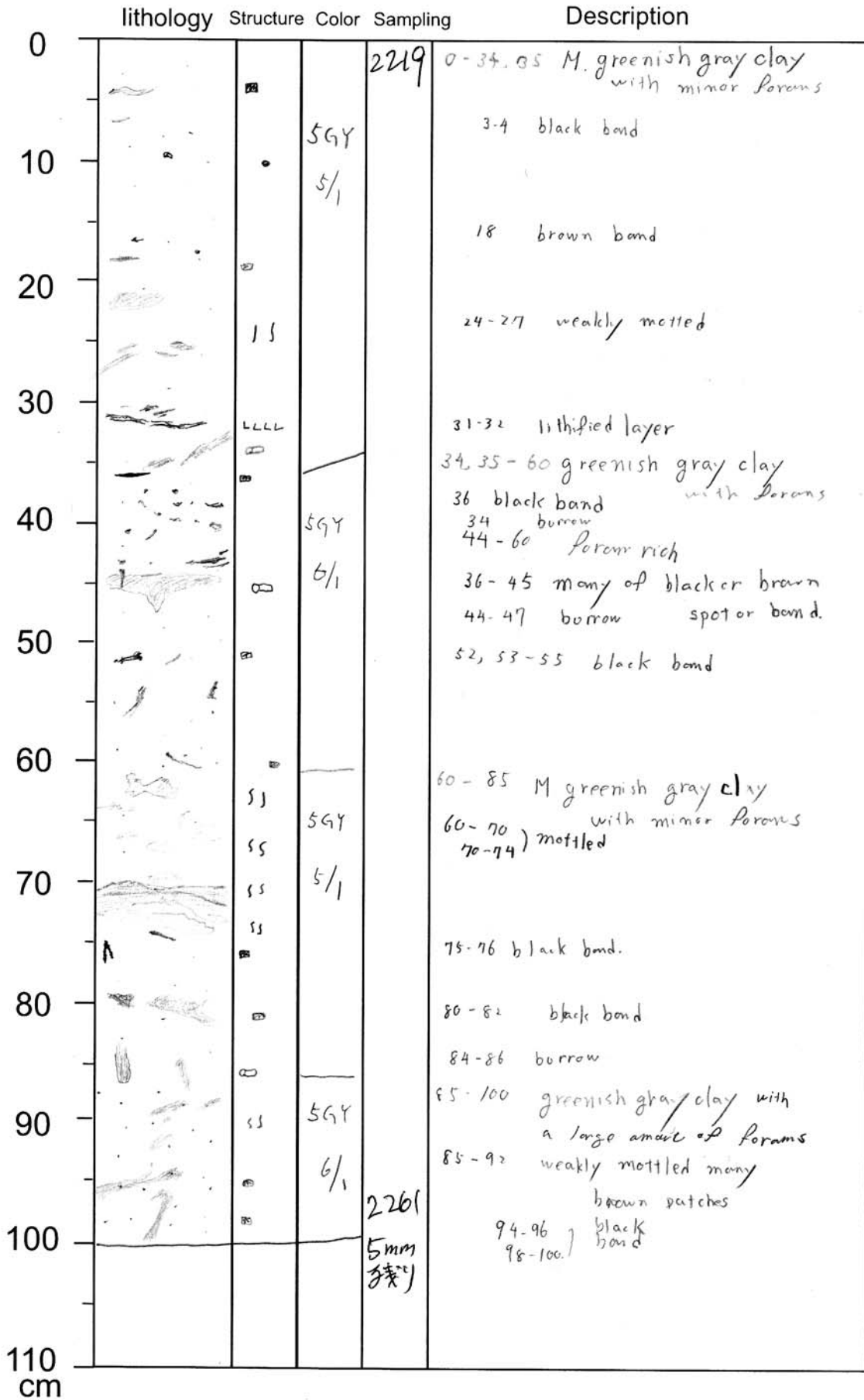
100.5

KR05-15

Date: 11/2 2005

CORE: PC sec 11

by: Suganuma



total length

section length

100

KR05-15

Date: 11/2 2005

CORE: P c1 sec. 12

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------------------|-------|-------------------|---|
| 0 | | | | 2262 | 0-29 Greenish gray clay 9-10 black patch 0-7 Foram rich relatively 7-29 minor forams 12-16 lithified layers 18 black spot 19, 22 black band 24-27 burrow |
| 10 | | ss LLLL LLLL | | 5GY 6/1 | |
| 20 | | • D | | | |
| 30 | | | | 5GY | 29-39 M. greenish gray clay with minor forams 29-33 mottled |
| 40 | | ss | | 5/1 | 36-37 black band. |
| 50 | | | | 5GY 0/1 | 39-64 greenish gray clay with forams 49-62 Foram rich 54 black band |
| 60 | | | | | |
| 70 | | L L L L L L L L | | 5GY 5/1 | 64-100 M greenish gray clay 65-68 partially lithified 73-75 lithified layers 70 1cm thick brown band. 76-79 mottled |
| 80 | | ss | | | 90 weakly mottled 93 black band. |
| 90 | | ss | | | |
| 100 | | | | 2304 (99.5 cm) | |
| 110 cm | | | | | |

total length

section length

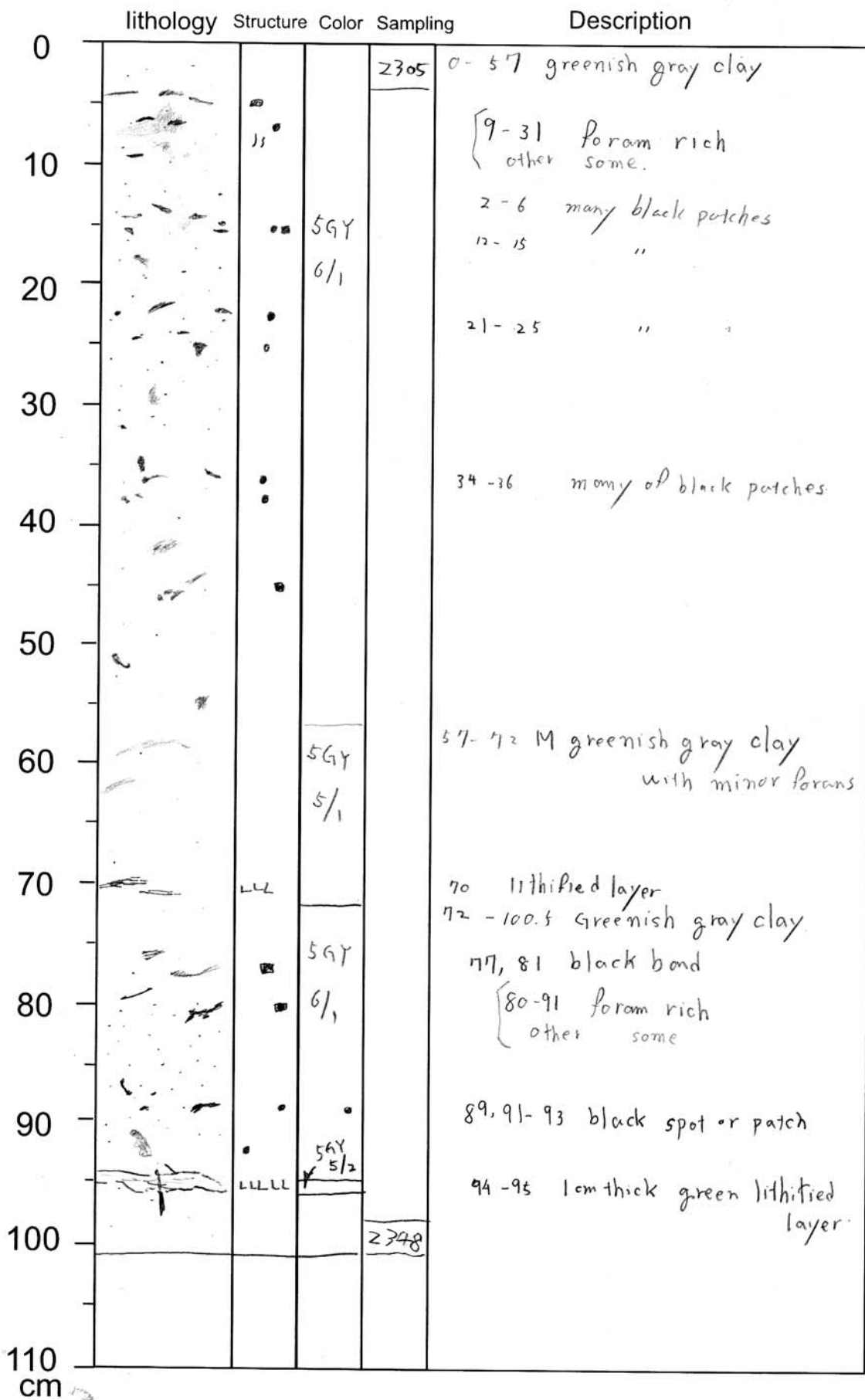
100

KR05-15

Date: 11/2 2005

CORE: Pc1 sec. 13

by: Suganuma



total length

section length

100.5

KR05-15

Date: 11/2 2005

CORE: PC / sec. 14

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|-------|----------|--|
| 0 | | | 5GY | 2349 | 0-9 greenish gray clay with minor forams |
| 10 | | | 6/1 | | |
| 20 | | | 5GY | | 9-24 M. greenish gray clay with minor forams |
| 30 | | SS | 5/1 | | 9-14 many of black bands or spots |
| 40 | | | 5GY | | 17-20 |
| 50 | | | 6/1 | | 24-33 greenish gray clay with minor forams |
| 60 | | LLLL | 5GY | | 24-26 mottled |
| 70 | | | 5/1 | | 28 brown band and patch |
| 80 | | | 5GY | | 33-40 M. greenish gray clay |
| 90 | | OO | 6/1 | | 39 unclear black patches |
| 100 | | OO | 5GY | | 40-56 greenish gray clay |
| 110 | | OO | 6/1 | | 41-43 unclear brown patch |
| 110 cm | | OO | | 2392 | 52.5 lithified layer |
| | | OO | | 5mm | 56-81 14 greenish gray clay |
| | | OO | | 8/1 | 60-65 mottled |
| | | OO | | | 67 light green layer |
| | | OO | | | 71, 72, 73, 78 black spots |
| | | OO | | | 81-100.5. foram rich |
| | | OO | | | Greenish gray clay |
| | | OO | | | 83-85 burrows |
| | | OO | | | 85-87 many brown patches |
| | | OO | | | 89 lithified layer |

total length

section length

100.5 cm

KR05-15

Date: 11/2 2005

CORE: Pc | Sec. 15

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|-------------|--------------------------------------|
| 0 | | | | 2393 | 0-3.5 foramrich greenishgray clay |
| | | SS | | 6/1 | 3.5 - 7 M.g.g clay mottled |
| | | | | 5/1 | |
| 10 | | | | 5GY | 7-40 dark.g.gray. clay with minor F. |
| | | | | 4/1 | 10 dark brown layer 5mm thick |
| | LLL | | | | 14-16 lithified layers |
| 20 | | | | | 19-20 brown layer 1cm thick |
| | | | | | 24, 26 black band or spot |
| 30 | | | | | |
| 40 | | | | | 37 black band |
| | | | | 5GY | 40-70 M.g.g. clay with minor F |
| | | | | 5/1 | 40-41 burrow |
| 50 | | | | | 43 black spot |
| 60 | | | | | 62-67 black spot or band. |
| 70 | | | | 5GY | 70-76 Dark.g.g clay minor F. |
| | | | | 4/1 | 73-74 black patch |
| 80 | | | | 5GY | 76-100 M.g.g.-clay |
| | | | | 5/1 | 77, 78. black band or patch |
| 90 | | | | | 86 black band |
| 100 | | | | 2434 | |
| 110 | | | | | |
| cm | | | | | |

total length

section length

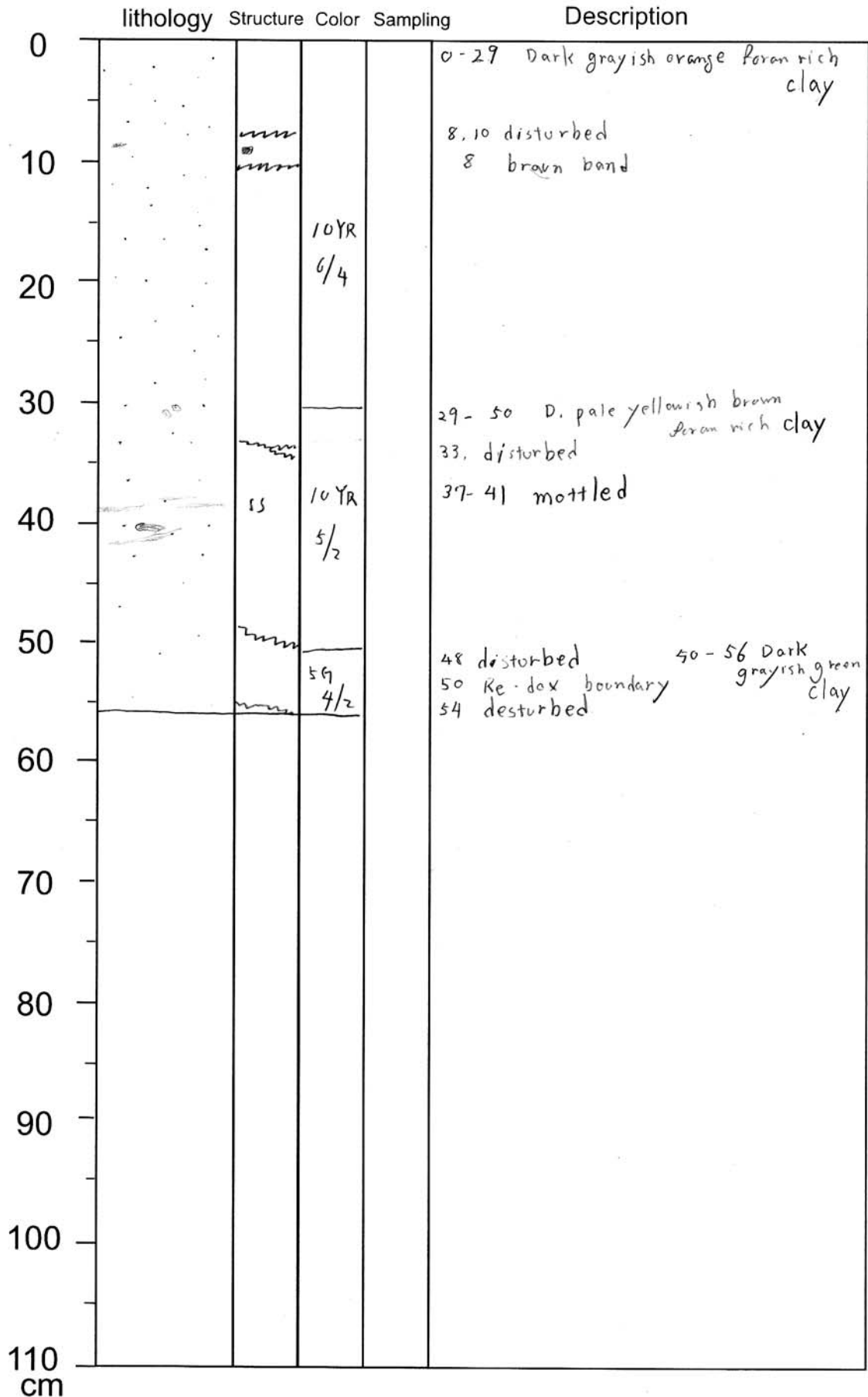
99cm

KR05-15

Date: 11/2

CORE: PC1 pilot

by: Suganuma



total length _____

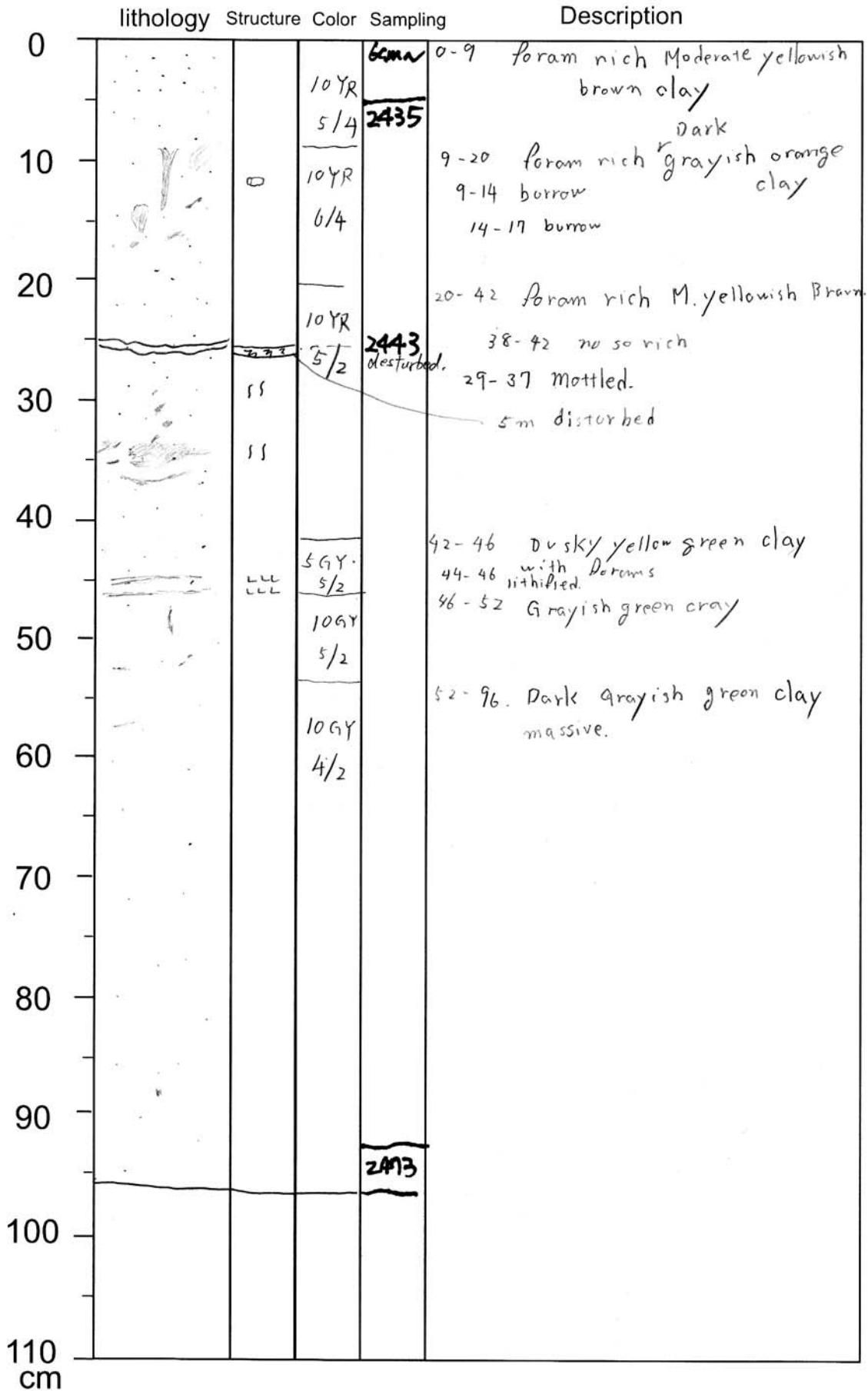
section length 56

KR05-15

Date: 11/2 2005

CORE: pc2 sec. 2

by: Soganuma



total length

section length

96 cm

KR05-15

Date: 11/2 2005

CORE: PC2 sec. 3

by: Suganuma.

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------------|---------------------------|--|
| 0 | | | | <u>3mm</u> <u>2474</u> | 0-98.5 Dark grayish green clay with forams |
| 10 | | | | | 10 black spot 13, 15 unclear brown patches |
| 20 | | | 10GY 4/2 | | |
| 30 | | | | | 33-36 burrow 35, 37, 39 unclear brown patches |
| 40 | | | | | 41.5 black spot |
| 50 | | | | | |
| 60 | | | | | 62 brown patch 64, 66 black spot |
| 70 | | | | | 71 black spot 75-76 black spot |
| 80 | | | | | |
| 90 | | | | | |
| 100 | | | | <u>2515</u> <u>1cm</u> | 96-97 black patch and band |
| 110 | | | | | |

total length

section length

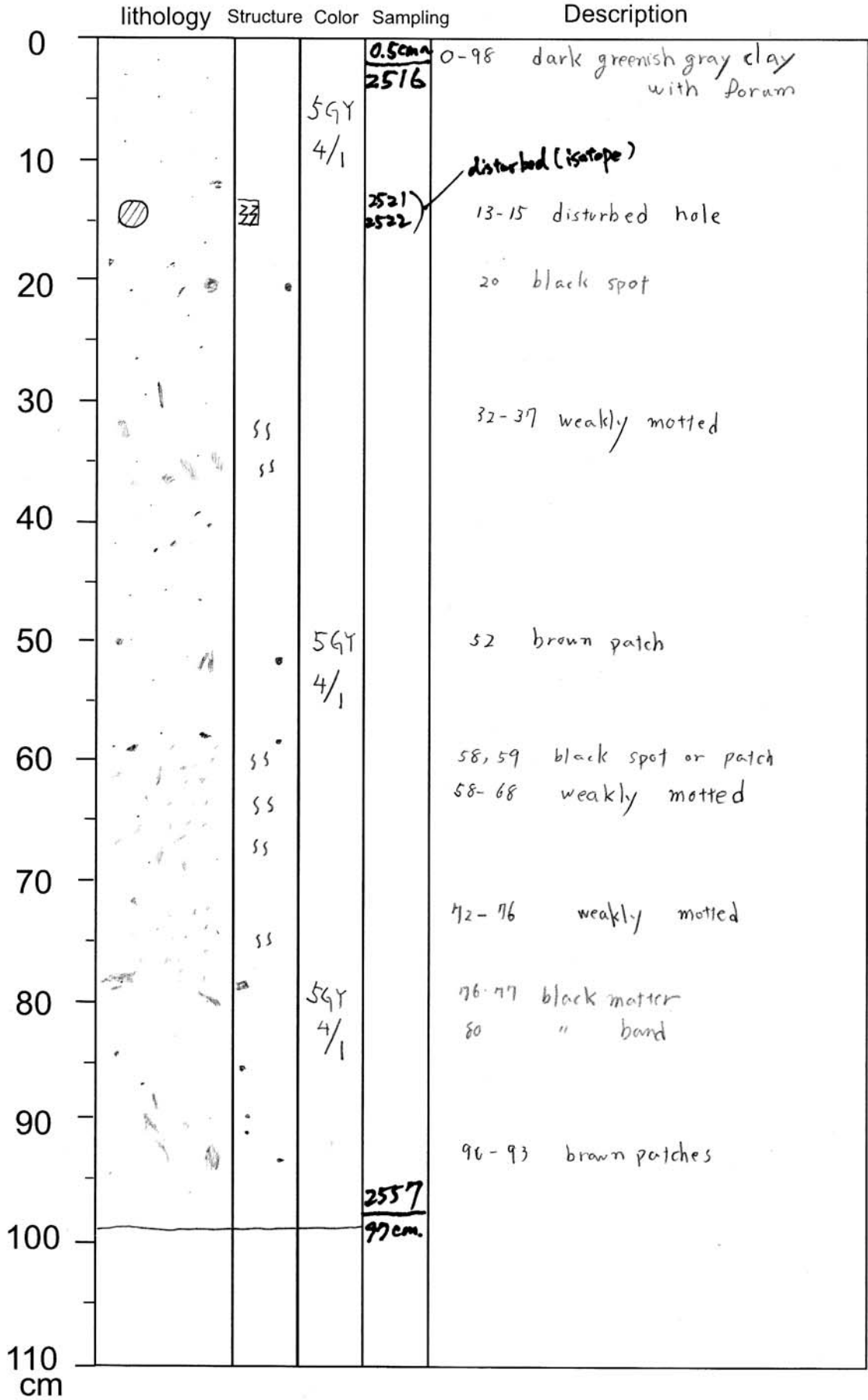
98.5

KR05-15

Date: 11/3 2005

CORE: PC2 sec 4

by: Ruya



total length

section length

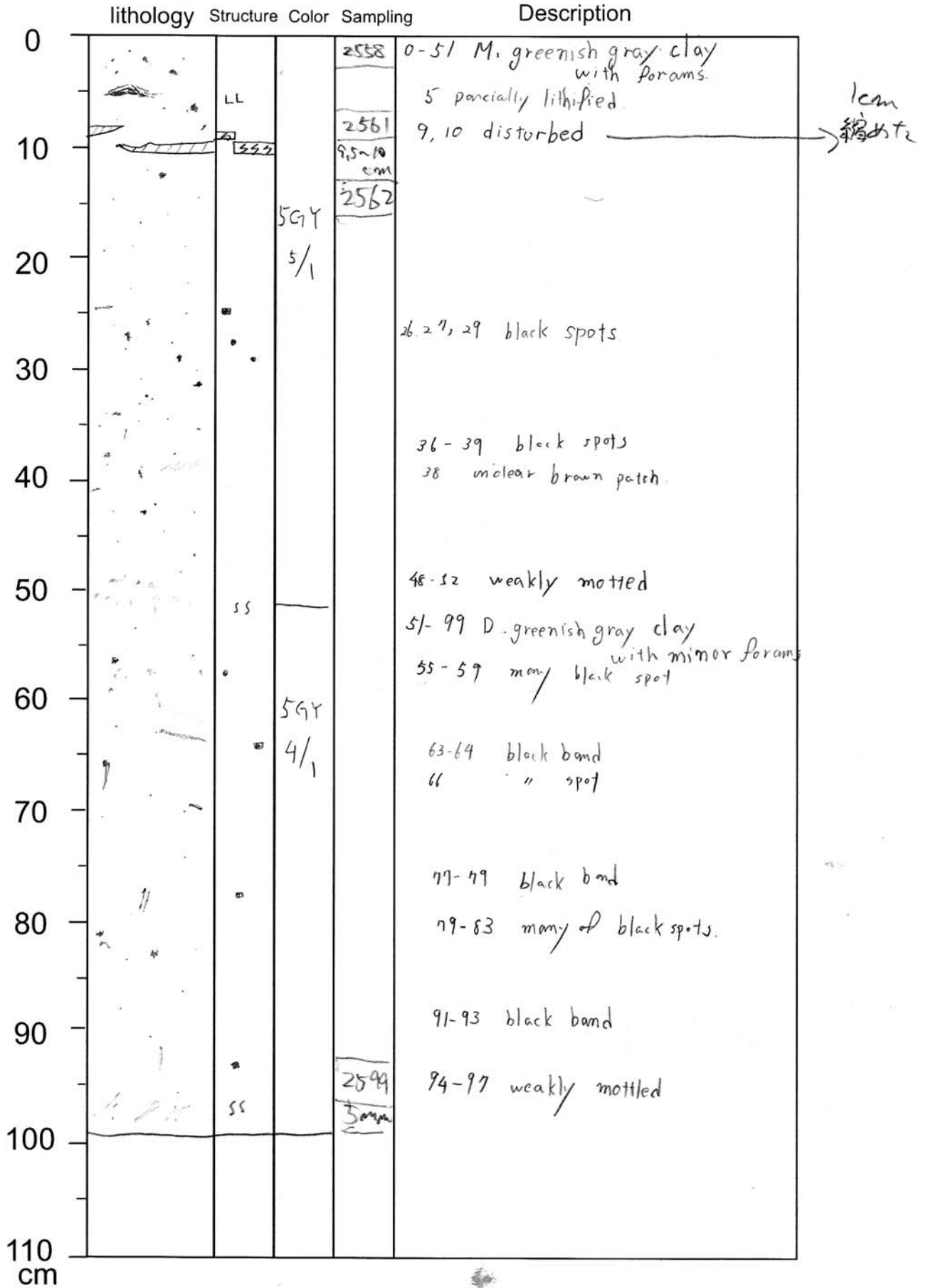
98

KR05-15

Date: 11/23 2005

CORE: pc2 sect

by: Suganuma



total length

section length

99 cm 98 cm

KR05-15

Date: 11/3 2005

CORE: PC2 sec. 6

by: Suganuma

Sample No. 2600
 218' L.F.

| | Lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|------------|-----------------------------------|--|
| 0 | | | | 0.5cm 2601 | 0-14 D.g.g. clay with minor forams |
| 10 | | | 5GY 4/1 | 2604 2606 | 9-12 Probably disturbed hole |
| 20 | | | | 2609 | 14-46 M.g.g. clay with minor forams 19-20 unclear brown layer disturbed? |
| 30 | | | 5GY 5/1 | 2611 2613 | 26-28 disturbed |
| 40 | | | | 2617 | 38-39 disturbed hole |
| 50 | | | 5GY 6/1 | 2620 47cm 2 52cm 2621 | 46-73 G.g. clay with forams 49 disturbed layer 51-53 unclear brown patches |
| 60 | | | | 2626 2627 | 58-72 foram rich 57-63 many brown patches 65-67 disturbed hole |
| 70 | | ss | | | 72-76-79 mottled |
| 80 | | | 5GY 5/1 | 2634 2635 | 73-97 M.g.g. clay 83-84 disturbed hole |
| 90 | | | | | 90 light green patch or burrow |
| 100 | | | | 2640 (96cm) | |
| 110 | | | | | |

total length _____

section length _____

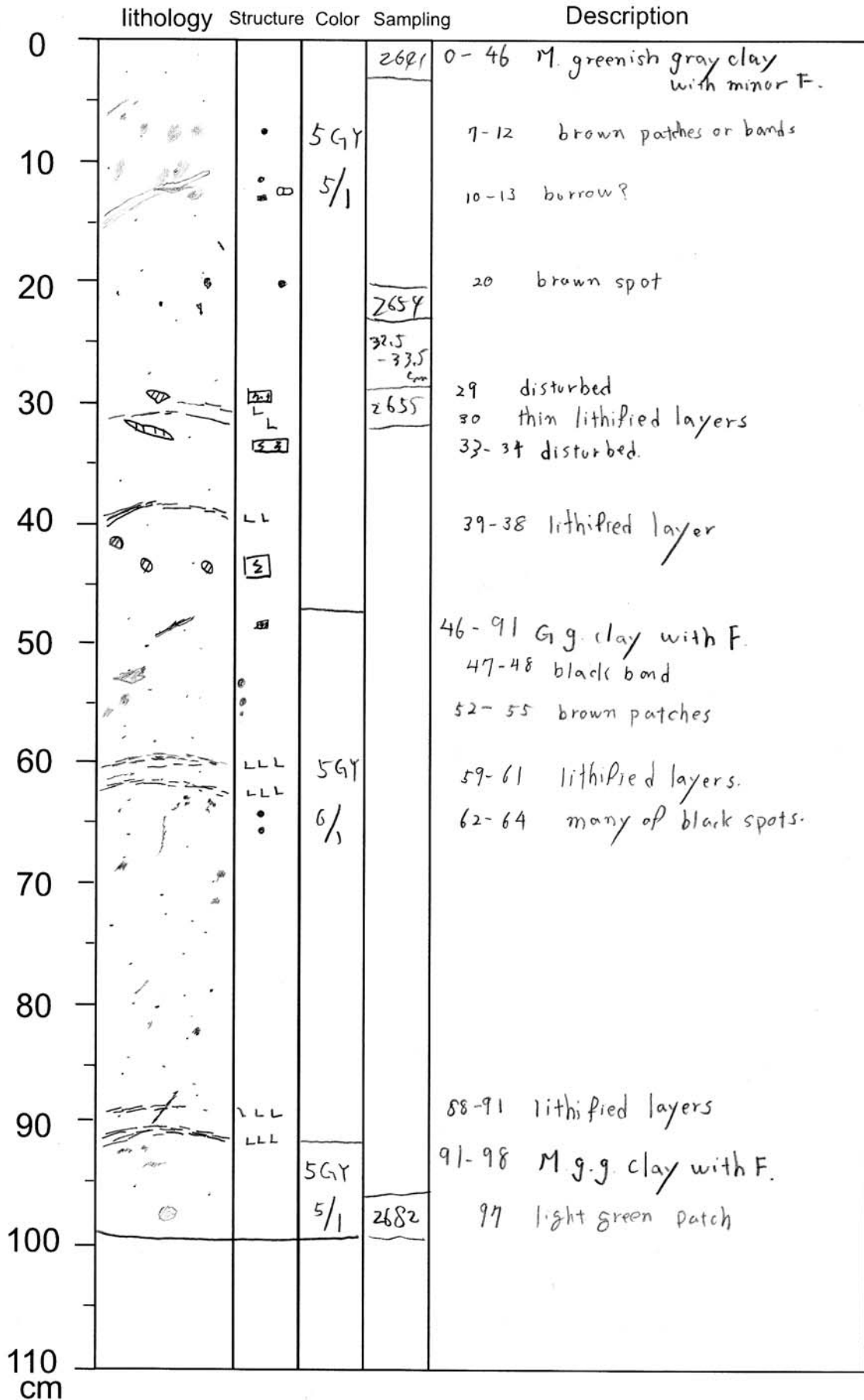
97

KR05-15

Date: 11/3 2005

CORE: PC2 sec. 7

by: Suganuma



total length _____

section length _____

98

KR05-15

Date: 11/3 2005

CORE: PC 2 sec. 8

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------------|------------|----------|---|
| 0 | | | | 2683 | 0-36 M. greenish gray clay with minor forams |
| 10 | | | | | |
| 20 | | | 5GY 5/1 | | 15-16 lighter colored layer 18 black spot 25-27 black band |
| 30 | | SS | | | 29-31 small disturbed holes 33 unclear dark brown layer |
| 40 | | SS | 5GY 6/1 | | 36-67 G.g. clay with forams 35-42 mottled 40-64 foram rich 45 black spot 47-49 dark green lithified layer |
| 50 | | LLL | | | |
| 60 | | | | | 60 black spot |
| 70 | | SS LL LLL | 5GY 4/1 | | 67-97.5 D.g.g. with minor forams 66-69 mottled 73-75 lithified layers 77-78 burrow 80 lithified layer 82 unclear patch |
| 80 | | LLL | | | |
| 90 | | | | 2724 | |
| 100 | | | | 1cm | |
| 110 | | | | | |

total length

section length 975

KR05-15

Date: 11/3 2005

CORE: Pc2 sec.9

by: Siganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|-------|-----------------|--|
| 0 | | | | 25 cm | 0-21 Dark greenish gray clay with minor F. |
| | | | 5GY | 2725 | 3 unclear layer |
| 10 | | | 4/1 | | 13 black spot |
| 20 | | | | | 21-100.5 M. g. g. clay with minor F. |
| 30 | | | 5GY | | 30 unclear band |
| | | | 5/1 | | 39 black band |
| 40 | | | | | 44, 46 black spots |
| 50 | | | | | |
| 60 | | | 5GY | | 60 unclear brown patch |
| | | | 5/1 | | 70 weakly thin hard layers |
| 70 | | HH | | | |
| 80 | | | | | 80 black spot |
| 90 | | | | | |
| 100 | | | | 2767 (99cm) | |
| 110 cm | | | | | |

total length

section length

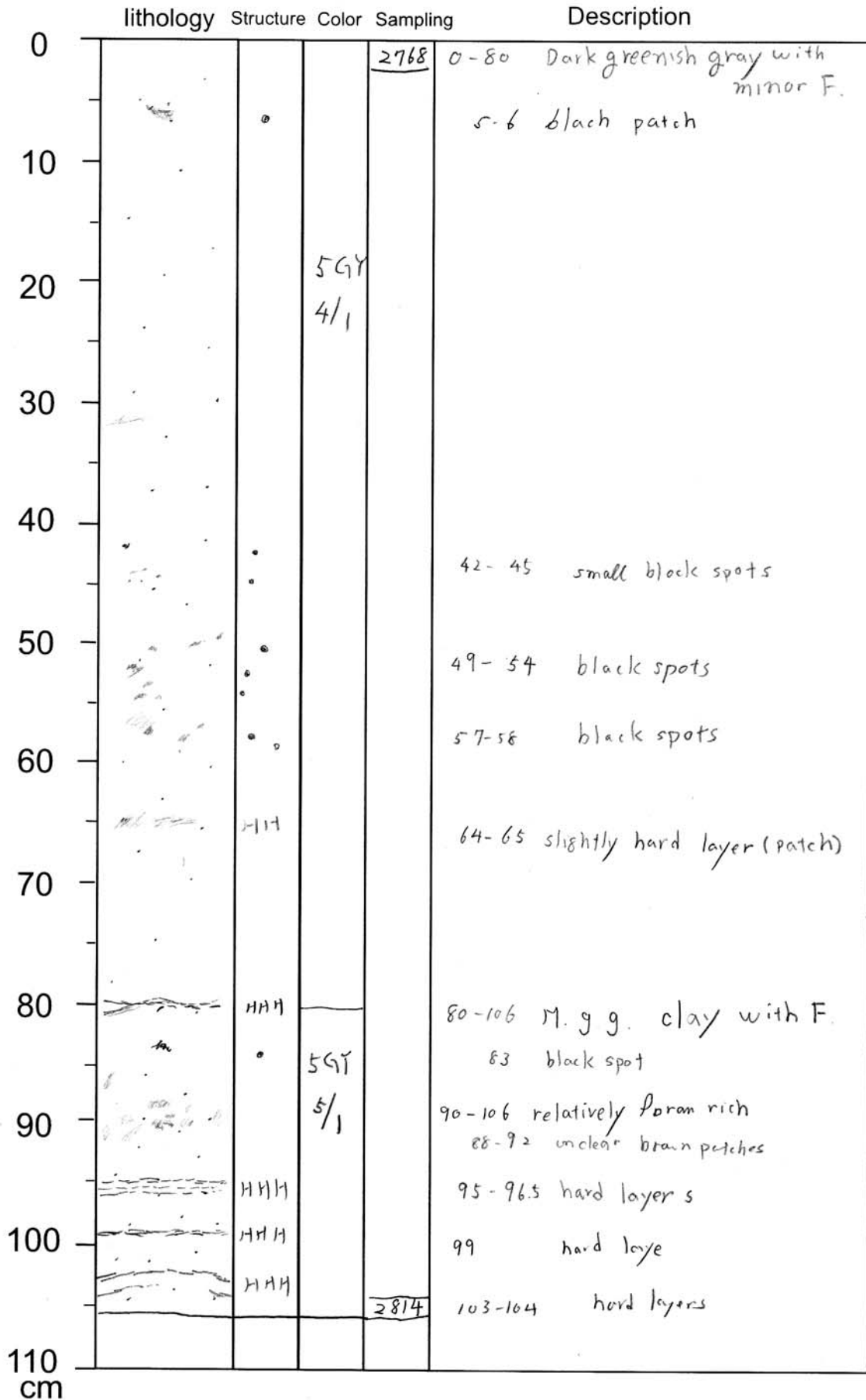
100.5

KR05-15

Date: 11/3 2005

CORE: pc2 sec.10

by: Suganuma



total length _____

section length 106 cm

KR05-15

Date: 11/3, 2005

CORE: PC 2 sec. 11

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|-------|------------------------------|---|
| 0 | | | | <u>0.5 cm</u> <u>2815</u> | 0-28 M. greenish gray clay with F. |
| 10 | | | 5GY | 5/1 | 4 black band 8 burrow |
| 20 | | | | | |
| 30 | | | | | 28-76 or 77 Dark greenish g clay with minor F. |
| 40 | | | 5GY | | 31 unclear black patch or burrow 34-36 green patches 40-41 black spots |
| 50 | | | 4/1 | | 48-58 very small number of forams 48 black patch or burrow 55 black patch |
| 60 | | | | | |
| 70 | | | | | 68-70 weakly mottled |
| 80 | | | 5GY | 5/1 | 76 or 77-84 M. g. g clay with F. 78 unclear brown layer 75-86 burrow? |
| 90 | | | 5GY | 6/1 | 84-100 G. g. g clay with relatively rich forams 88-92 brown patch or band |
| 100 | | | | <u>2857</u> | |
| 110 cm | | | | | |

total length _____

section length _____

100

KR05-15

Date: 4/11/3 2005

CORE: PC2 sec. 12

by: Saganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|------------|------------|----------|---|
| 0 | | | 5G4 5/1 | 2858 | 0-4 M. greenish gray clay with F 1 Hard layer |
| 10 | | SS | 5G4 4/1 | | 4-37 Dark g.g. clay with minor F 4-6 hard patch 6-13 mottled 15,16 black spot 21.5 black spot 22 thin hard layer |
| 20 | | HHH | | | 25-27 D. brown patch 28 black spot 30-35 burrows |
| 30 | | | | | 38-41 mottled |
| 40 | | | 5G4 6/1 | | 37-52 Foram rich g.g. clay 47-49 brown patch |
| 50 | | HH | | | 52-95 M. g.g. clay with F 53 partially hard layer |
| 60 | | | 5G4 5/1 | | 63-64 D. brown patch 65,66 thin hard layers |
| 70 | | HHH HHH | | | 70,71 thin hard layers |
| 80 | | | | | 74-79 D. brown band. |
| 90 | | | | | 88 D. brown patch. |
| 100 | | SS | 5G4 4/1 | 2900 | 94-98 mottled 95-99 |
| 110 | | | | | |

total length

section length

99

KR05-15

Date: 11/3 2005

CORE: P c2 sec. 13

by: Suganoma.

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|------------|--------------|---|
| 0 | | | | 290 | 0-17 M. greenish gray clay with minor F 2,3 black patches. |
| 10 | | | 5GY 5/1 | | 17-19 burrow |
| 20 | | | 5GY 6/1 | | 17-41 Foram rich g.g. clay 22 black band 25 black spot |
| 30 | | | | | |
| 40 | | | | | |
| 50 | | | 5GY 5/1 | | 41-90 M. g.g. clay with minor F. 43-44 unclear dark brown layer 48-51 thin hard layers. 56 hard patch. 61-62 brown patch. 73-74 black band or spot. 80 black spot 81 unclear brown patch 88-92 mottled 89 pumice |
| 60 | | | | | |
| 70 | | | | | |
| 80 | | | | | |
| 90 | | | | | |
| 100 | | | 5GY 6/1 | 2943 15cm | 90-99 97-88 black band |
| 110 | | | | | |

total length

section length

99

KR05-15

Date: 11/3 2005

CORE: Pc 2 sec 14

by: Soganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|--------------|--------------------------------------|
| 0 | | | 5GY | 2944 | 0-57 M. Greenish gray clay with F. |
| 10 | | | | | 2-6 black patch |
| 20 | | | | | 10-16 Poran rich |
| 30 | | | | | 12 black spots |
| 40 | | | | | 16 black spots |
| 50 | | | | | 22-24 unclear burrow? |
| 60 | | | | | 28-30 black band. |
| 70 | | | | | 34 black band |
| 80 | | | | | 40-46 many of black spot or patch |
| 90 | | | | | 55 black spot |
| 60 | | | 5GY | 4/1 | 57-73 Dark. g. g. clay with minor F. |
| 70 | | | | | 62-68 bioturbated (mottled) |
| 80 | | | 5GY | 5/1 | 73-87 M. g. g. clay with minor F |
| 90 | | | | | 79-80 1cm thick hard layer |
| 100 | | | | | 84 black spot |
| 90 | | | 5GY | 6/1 | 87-100 G. g. clay with F. |
| 100 | | | | | 89-97 burrows |
| 100 | | | | 2986. (99cm) | 97 Poran rich |

total length

section length

100

KR05-15

Date: 11/2, 2005

CORE: Pc 2 sec. 15

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|----------|--|
| 0 | | | | 2987 | 0-14 M. greenish gray clay with minor F. |
| | | | 5GY | | 3-4 black band |
| | | HHH | 6/1 | | 7 hard layer |
| 10 | | | | | 8 black spot |
| | | □ | | | 10-16 unclear burrow |
| 20 | | HHH | | | 18 Hard layer |
| | | HH | | | 22-24 Hard layers |
| | | HHH | | | 26 Hard layers |
| 30 | | HHH | | | 31 burrow |
| | | □ | | | 31-39 bioturbated (mottled) |
| | | SS | | | 40 black spots |
| 40 | | SS | | | 42-46 mottled |
| | | SS | | | 44-63 M. g. g. clay with minor F. |
| 50 | | SS | 5GY | | 45, 47 black spots |
| | | ○ | 5/1 | | 53 black spot |
| 60 | | | | | |
| 70 | | SS | 5GY | | 65-80 G. g. clay with minor F |
| | | | 6/1 | | 66-72 mottled |
| | | ○ | | | 74, 76 black spot |
| 80 | | | 5GY | | 80-92 M. g. g. clay with minor F |
| | | ○ | 5/1 | | 80 Dark brown layer |
| | | ○ | | | 83-86 light green patch. |
| 90 | | ○ | | | 90-91 " |
| | | | 5GY | | 92-100 G. g. clay with minor F |
| 100 | | | 6/1 | 3029 | 93 - Poron relatively rich |
| | | | | 3cm | |
| 110 | | | | | |
| cm | | | | | |

total length

section length

100 cm

KR05-15

Date: 11/3 2005

CORE: PC 2 sec. 16

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|------------|---|-------|---------------|---|
| 0 | | | 5GY | 0.5cm 3030 | 0-20 Greenish gray clay with minor F. 1-4 mottled many black spots |
| 10 | | | | 6/1 | 14-18 many black spots. |
| 20 | | | | 5GY 5/1 | 20-25 M. g. g. clay 22 black spot |
| 30 | | | | 5GY | 25-51 Dark g. g. clay 28-31 burrow |
| 40 | | | | 4/1 | 35-37 burrow |
| 50 | | | | 5GY 5/1 | 43-44 black spots 49-52 burrow 51-60 M. g. g. clay |
| 60 | | | | 5GY | 60-82 ⁽⁷⁵⁻⁸¹⁾ Foram rich light greenish gray clay 59-65 mottled |
| 70 | | | | 4/1 | |
| 80 | | | | 5GY 6/1 | 82-88 G. g. clay |
| 90 | | | | 5GY 5/1 | 88-96 M. g. g. clay 93-95 Hard layer |
| 100 | 5GY 4/1 | 96-100. Dark g. g. clay 97 brown layer | | | |
| 110 cm | | | 3073 | | |

total length

section length

100

KR05-15

Date: 11/4 2005

CORE: P02 sec 17

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|---------------|------------|------------|---|
| 0 | | H H HHH | | 3074 | 0-52 M. greenish gray clay with minor foram |
| 10 | | • • □ | | | 1-3 partially hard layers 5 hard layer 8, 9 black spots 12-13 burrow |
| 20 | | | 5G 5/1 | | |
| 30 | | • | | | 26 black spot 30 black spots |
| 40 | | • | | | 37 black patch 40 Dark brown patch or bands |
| 50 | | | | | 46 D. brown band |
| 60 | | | 5GY 5/1 | | 52-94 M.g.g. clay 58-68 relatively foram rich |
| 70 | | • | | | 70 D. brown band 73 brown band |
| 80 | | • | | | 77-80 burrow? |
| 90 | | • | | | 87-88 burrow? 90-93 black patch. |
| 100 | | HH | 5G 4/1 | 316 1cm | 94-98.5 D.g.g. clay 96 partially disturbed and Hard layer |
| 110 cm | | | | | |

total length

section length

98.5

KR05-15

Date: 11/4 2005

CORE: PC2 sec. 18

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|-----------------|---|
| 0 | | | | (0.5cm) 3117 | 0-40 Dark greenish gray clay with minor F. 1-4 black spots |
| 10 | | | | 5G 4/1 | 14 black spot |
| 20 | | | | | 20.5-21.5 black spots 24 black band |
| 30 | | | | | 28 black patch |
| 40 | | | | 5G | 33-34 black spots 38 black spot |
| 50 | | | | 5/1 | 40-55 M.g.g. clay with minor F. 40-41 black spots |
| 60 | | | | 5G 4/1 | 51-52 black patches 54-58 bioturbated (mottled) 55-61 D.g.g. clay 60-66 many of brown patches. 61-85 G.g. clay with F |
| 70 | | | | 5GY 6/1 | 68-71 black spots 70 brown band 73 black spot 76-80 burrow 80 black spot 82-86 mottled 82-85 burrow |
| 80 | | | | 5G 4/1 | 85-99 D.g.g. clay with minor F. 86 black spot 90-92 mottled |
| 90 | | | | 5GY 6/1 | 91-99 G.g. clay with F 91-93 burrow 93 black spot 94-99 bioturbated |
| 100 | | | | 3157 97cm | |
| 110 | | | | | |

total length

section length

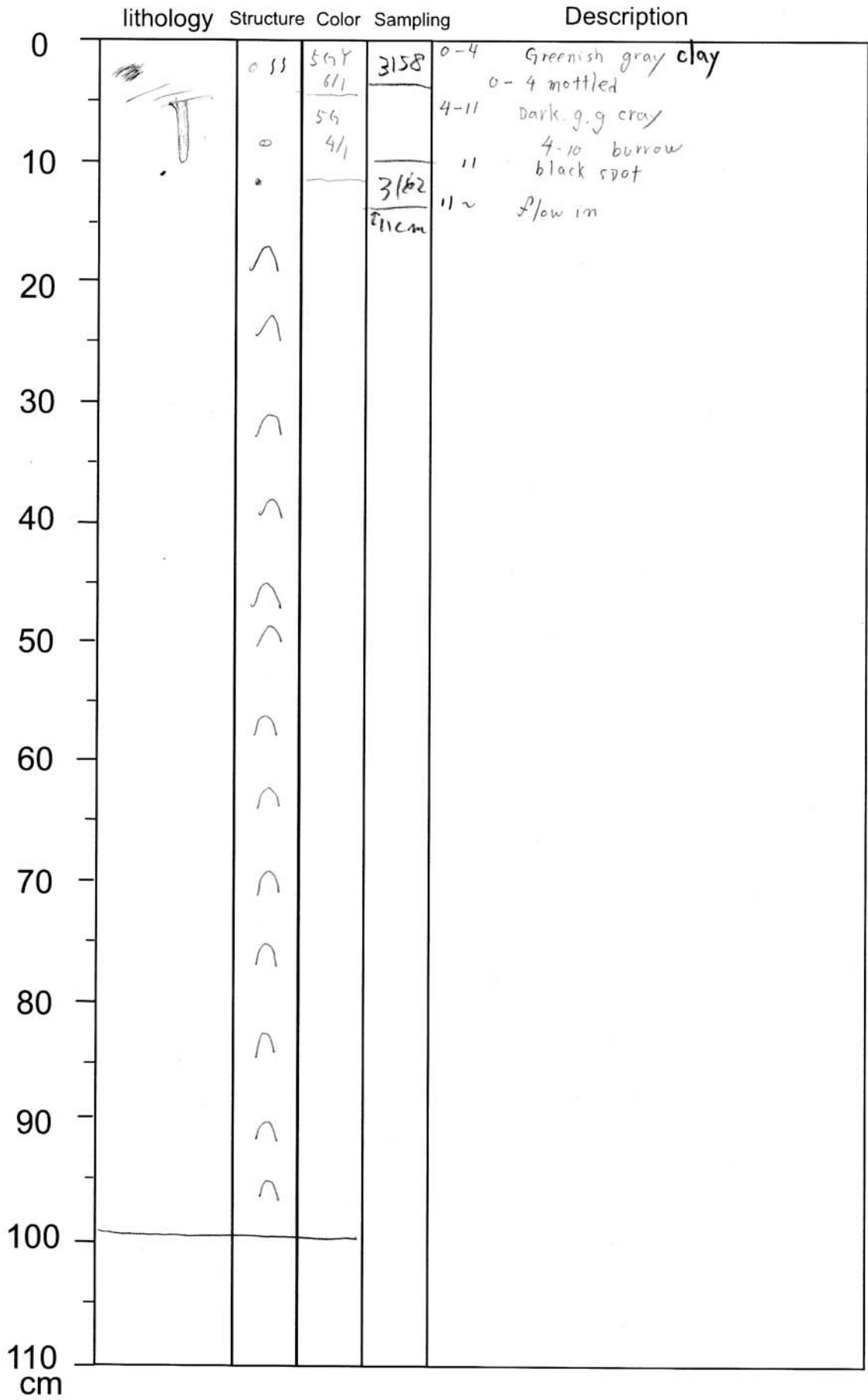
99

KR05-15

Date: 11/4 2005

CORE: PC2 sec. 19

by: Soganuma



total length _____

section length 98.5

KR05-15

Date: 11/2 2005

CORE: pc2 pilot

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----------|-----------|-----------|-------|-------------|---|
| 0 | | | | | 0-20 Dark Grayish orange clay foram rich |
| 10 | | | | 10YR 6/4 | |
| 20 | | | | | 20-39 Dark pale yellowish brown clay foram rich |
| 30 | | ss | | 10YR 5/2 | 30-36 mottled 33 disturbed |
| 40 | | ss | | 5G7 5/2 | 39-42 Dusky yellow green clay 41-43 disturbed foram rich |
| 50 | | ss | | 5G7 5/2 | 42-52 Grayish green clay with F. 47 disturbed |
| 60 | | | | | |
| 70 | | | | | |
| 80 | | | | | |
| 90 | | | | | |
| 100 | | | | | |
| 110 cm | | | | | |

total length _____

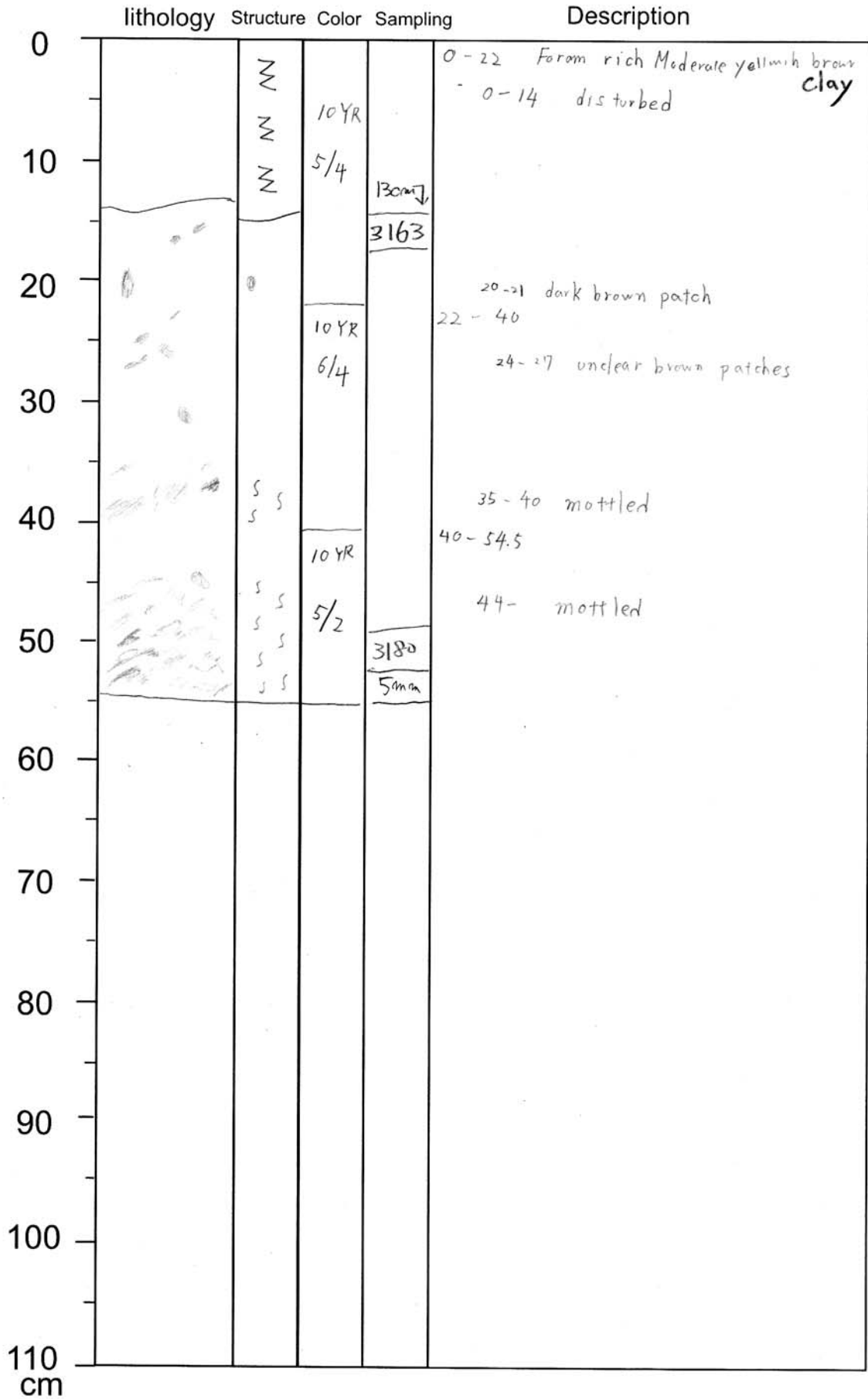
section length 52

KR05-15

Date: 11/4 2005

CORE: PC3 sec. 2

by: Suganuma.



total length

section length

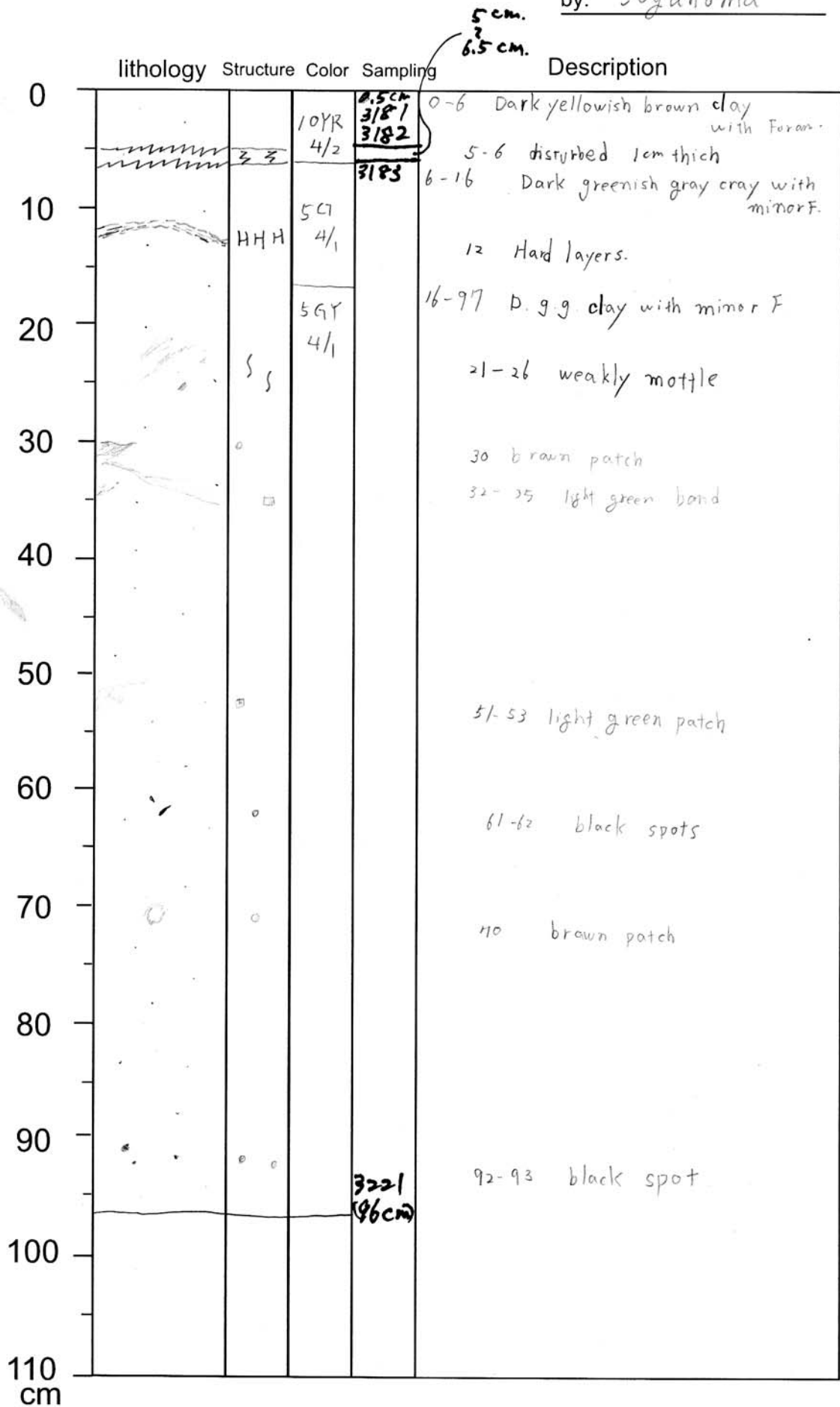
54.5

KR05-15

Date: 11/4 2003

CORE: Pc3 sec.3

by: Suganuma



total length

section length

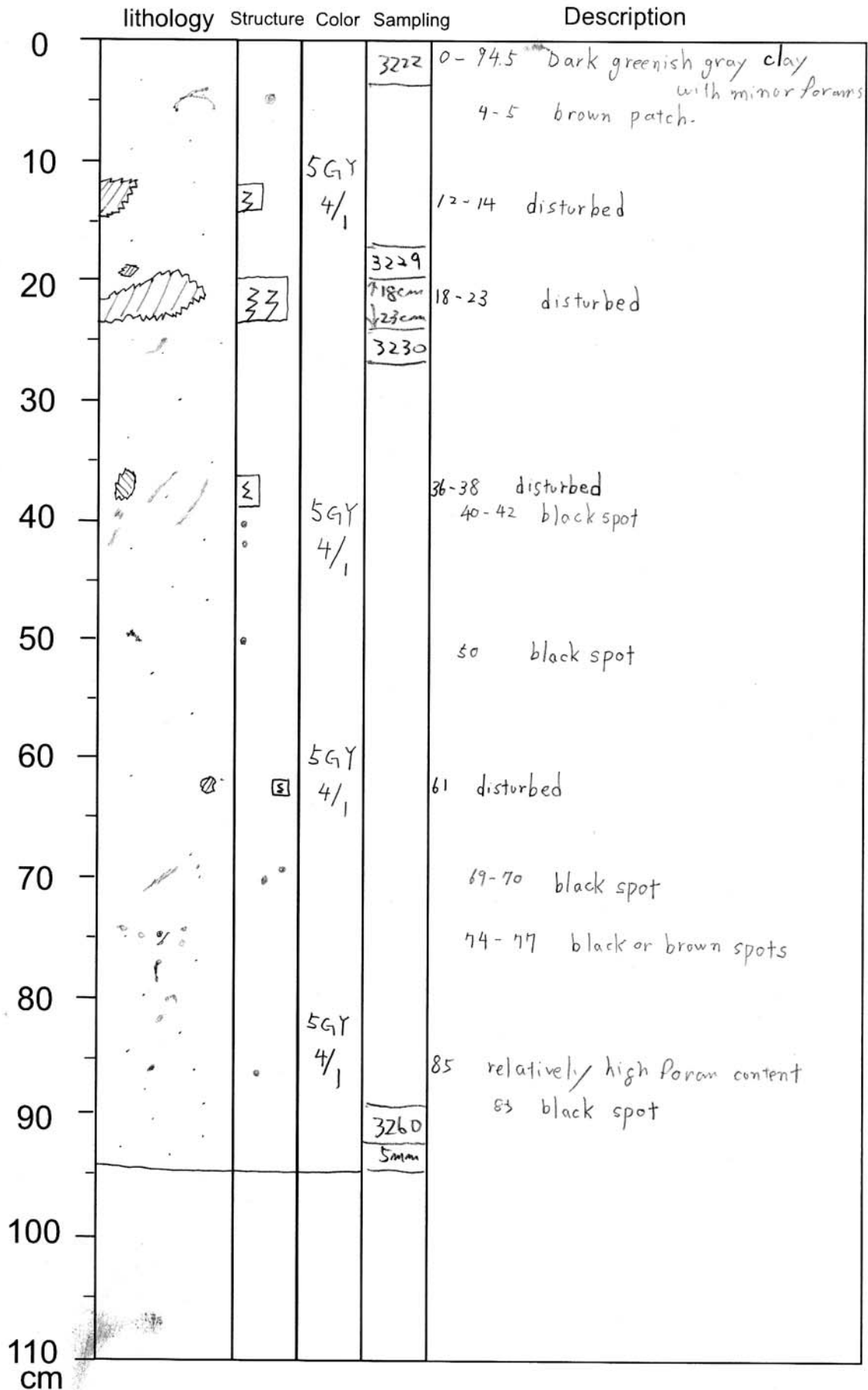
97

KR05-15

Date: 11/4 2005

CORE: pc3 sec.4

by: Suganum.



total length

section length 94.5

KR05-15

Date: 11/4 2005

CORE: P03 sec. 5

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|------------|----------|--|
| 0 | | | | 3261 | 0-96 Greenish gray clay with minor forams. |
| 10 | | | 5GY 4/1 | | 8-10 black spots |
| 20 | | | | | |
| 30 | | | 5GY 4/1 | | 31... brown spot |
| 40 | | | | | 42-46 weakly mottled 43 black spot |
| 50 | | | 5GY 4/1 | | |
| 60 | | | | | 64-66 black spots |
| 70 | | | 5GY 4/1 | | 66-68 disturbed 70 black spot |
| 80 | | | | | 78-86 black spots |
| 90 | | | | | 88-90 black spots |
| 100 | | | | 3301 | |
| 110 | | | | | |

total length

section length

96

KR05-15

Date: 11/4 2005

CORE: pc3 sec.6

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-------------|------------|------------------------|---|
| 0 | | | | 3302 | 0-94.5 Dark greenish gray clay 2 black spot with minor Forams |
| 10 | | | 5GY 4/1 | 3305 9-13cm 3306 | 9.5-13 disturbed hole 6-15 black line circle surrounding the hole 17 black spot |
| 20 | | H H | 5GY 4/1 | 3312 | 22,24-25 hard patch 27 black spot |
| 30 | | | 5GY 4/1 | 29.5 35 3313 | 29 black and brown spot 30-34 disturbed hole 39 black spot |
| 40 | | H | 5GY 4/1 | | 43 hard patch |
| 50 | | | | | 49-63 vertical black lines |
| 60 | | | 5GY 4/1 | | |
| 70 | | | | | |
| 80 | | | 5GY 4/1 | | 80 black band |
| 90 | | S S S | | 3337 1.5cm | 82-88 mottled |
| 100 | | | | | |
| 110 | | | | | |

total length

section length

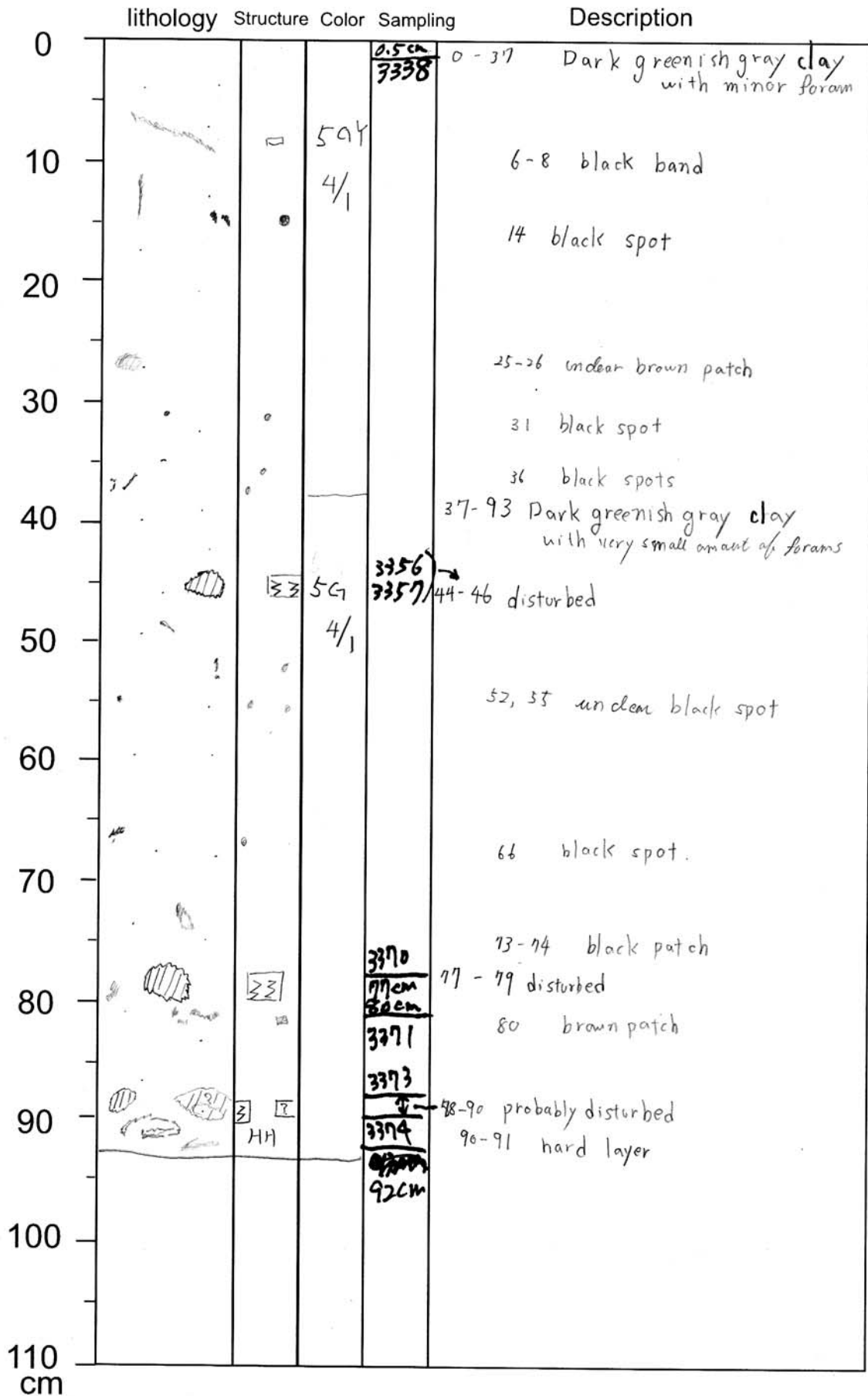
94.5

KR05-15

Date: 11/4 2005

CORE: P03 sec 7.

by: Suganuma



total length

section length

93

KR05-15

Date: 11/4 2005

CORE: PC3. sec. 8

by: Suganya

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|------------|----------------|---|
| 0 | | [3] | 5G 4/1 | 5mm 3375 | 0-15 Dark greenish gray clay |
| 10 | | | | 5-7cm 3376 | 5-8 brown patches 6-7 disturbed |
| | | | | 3377 | |
| 20 | | [3] | 5GY 4/1 | | 15-24 Dark greenish gray clay |
| 30 | | | | | 18-21 brown patch 23-24 brown patch |
| 40 | | | | | 24-51 25-26 brown patch 27-41 many of patches |
| 50 | | [3] | 5G 6/1 | 3394 | 46 Dark brown patch |
| 60 | | | | | 47-51 mottled 49-50 disturbed |
| 70 | | | | | 51-93.5 D.g.g. clay |
| 80 | | [3] | 5G 4/1 | 50.5cm 3395 | 54-69 disturbed (mottled) |
| 90 | | | | | 60, 65, 66 lighter green patch |
| 100 | | | | | 69 disturbed |
| 110 | | [3] | HH | | 70 lighter green layer |
| | | | | | 73 patch |
| | | | | | 76-85 burrows 84-88 black band 89 black spot |
| | | | | 3413 | 91 slightly hard layer. |

total length _____

section length 93.5

MR05-03

Date: 11/4 2005

CORE: p c 3 sec. 9

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------------|-------|----------------|---|
| 0 | | | | 0.5 cm 3414 | 0-34 Dark greenish gray clay with minor F. |
| 10 | | HHH | | 5G 4/1 | 3 black bands 5 Hard layer |
| 20 | | HH | | 3420 | 14 Disturbed hole 19 Black spots 20-22 Hard patch |
| 30 | | | | 3426 3427 | 29-30 Disturbed hole |
| 40 | | | | 3428 | 34-47 Greenish g clay with F |
| 50 | | | | 5GY 6/1 | 34 Disturbed hole 35-39 Brown patches 45 Thin hard layer 47 Maybe disturbed 51 Dark green layer |
| 60 | | | | | 59-61 Black band or spot |
| 70 | | HH HHH SS | | | 69-71 Hard layers 72-74 mottled 76-77 Hard layer |
| 80 | | HH | | 5G 4/1 | 77-95 D.g.g with minor F. 77-83 Black spots |
| 90 | | HHH | | 3454 93.5 | 93 Hard layer |
| 100 | | | | | |
| 110 cm | | | | | |

total length

section length

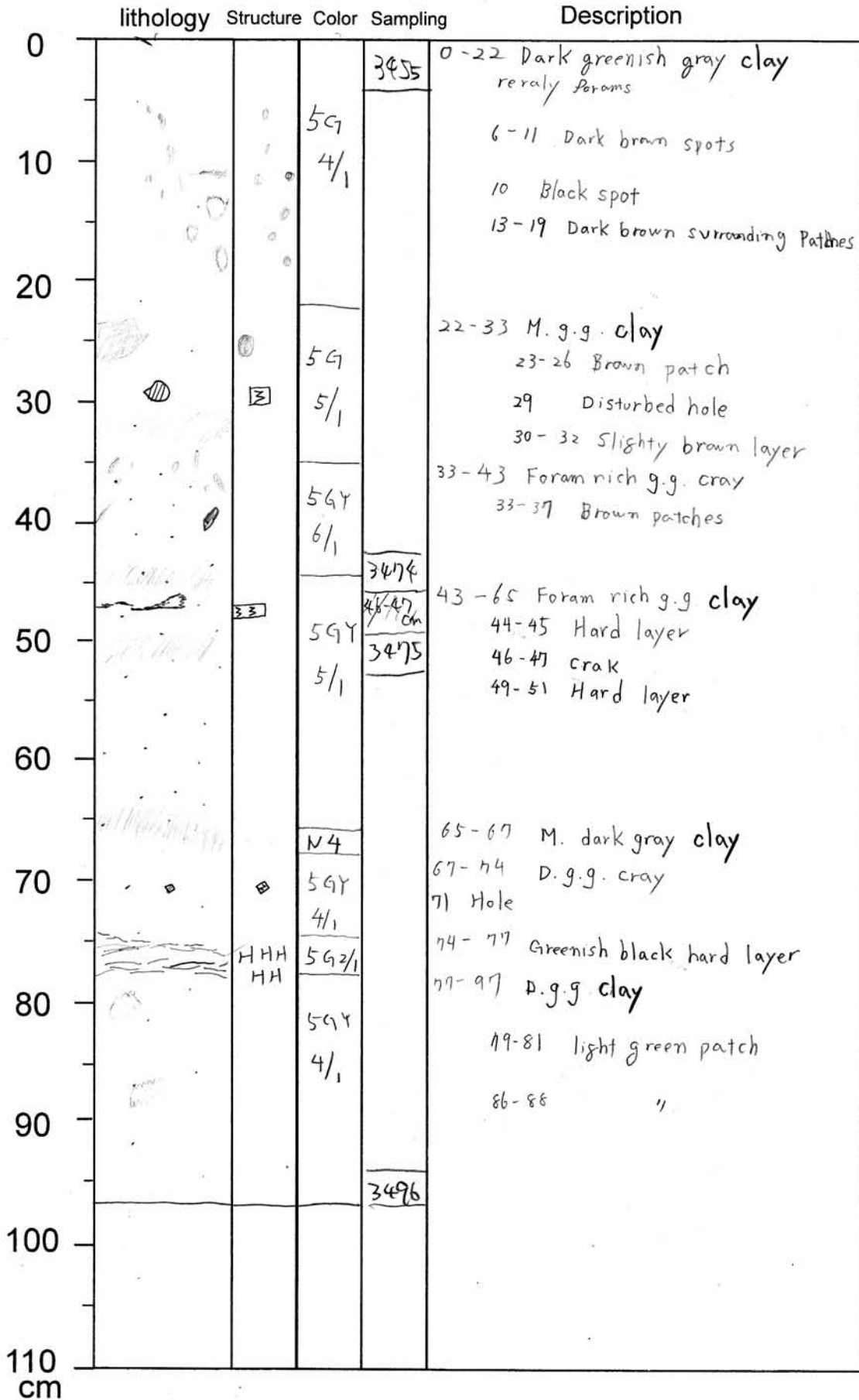
95

MR05-03

Date: 11/4 2005

CORE: PC3 sec. 10

by: Suganuma



total length

section length

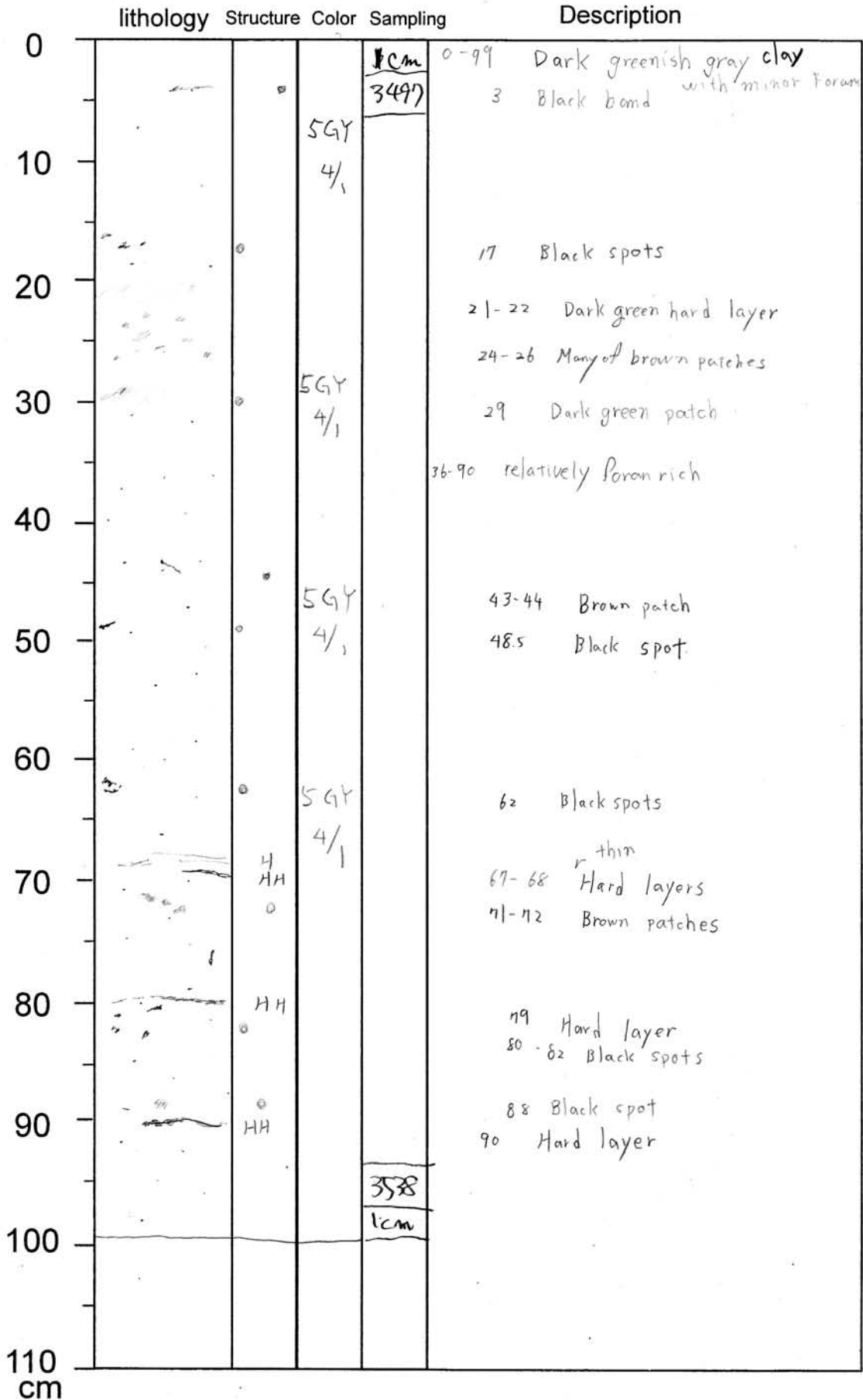
97

MR05-03

Date: 11/5 2005

CORE: Pc 3 sec. 11

by: Suganuma



total length

section length

99

MR05-03

Date: 2005 11/5

CORE: PC3 sec 12

by: Suganuma

| 0 | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|------------|-------------|---|
| | | | | 5mm 3539 | |
| 0 | | | | | 0-90 Dark greenish gray clay with minor foram |
| 10 | | | 5GY 4/1 | | 11 Black spot 15 Black spot |
| 20 | | | | | 20-21 Black spot |
| 30 | | | 5GY 4/1 | | 30-31 Black spot 33-36 Unclear black line other many spot |
| 40 | | | | | 41 Unclear brown patch 41-43 Black spots |
| 50 | | | | | 47, 48 Black spots |
| 60 | | | 5GY 4/1 | | 53-55 } Black spots 57-58 } |
| 70 | | | | | 62-63 Black spots 66-67 Black line 65-69 " spots |
| 80 | | | | | 70-71 Unclear brown patch 72 " 75-76 Black spots |
| 90 | | | 5GY 6/1 | | 86-87 Black spot 89 Unclear brown patch |
| 100 | | HH | | 5mm 3580 | 90-99 Greenish gray clay with foram 91 Dark brown patch 97-98 thin hard layer |
| 110 | | | | | |

total length

section length

99.5

MR05-03

Date: 11/5 2005

CORE: PC 3 sec.13

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|----------|------------------------------------|
| 0 | | | | 3581 | 0-55 Greenish gray clay |
| | | | | | 3 Dark brown spot with many forams |
| | | | | | 8 Dark brown spot |
| 10 | | HHH | 5GY | | 12-13 Thin hard layers |
| | | HHH | 6/1 | | 14 Hard layer |
| | | | | | 13 Dark brown spot |
| 20 | | HHH | | | 19 Thin Dark brown line |
| | | HH | | | 20.5) Thin hard layer |
| | | | | | 22 |
| | | | | | 24-29 Dark brown patch or lines |
| 30 | | | | | 33-36 Black patch |
| 40 | | | | | 42 Unclear green hard layer |
| | | | | | 43-45 Black spots |
| 50 | | | | | 50 Unclear brown patch |
| | | | | | 52-54 Black spots |
| | | | 5G7 | | 55-99 Dark gg clay with minor F. |
| 60 | | | 4/1 | | 64-65 Brown patches |
| 70 | | HHH | | | 71-72 Thin hard layer |
| | | (H) | | | 74 Hard patch |
| 80 | | | | | 83-84 Thin dark brown line |
| 90 | | (H) | | | 91-92 Dark green hard patch |
| | | | | | 97 Black spot |
| 100 | | | | 3624 | |
| 110 | | | | | |
| cm | | | | | |

total length

section length

99

MR05-03

Date: 11/5 2005

CORE: Pc 3 sec 14

by: Sogamura

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|----------|---|
| 0 | | | 5G | 365 | 0-5 Dark greenish gray clay with ^{foram} minor |
| | | SS | 4/1 | | 4-6 mottled |
| 10 | | | 5G | | 5-16 M.g.g. clay with minor F. |
| | | | 5/1 | | 8-13 Many brown patches |
| | HHH | | | | 14, 16 Thin hard layer |
| | HH | | | | 16-36 G.g. clay with F. |
| 20 | | | 5GY | | 17-21 Many black spot |
| | | | 6/1 | | 26 less thick Dark brown layer |
| 30 | | | | | 28-33 relatively foram rich |
| | | | | | 34 Black band |
| 40 | | SS | 5GY | | 36-53 D.g.g. clay with minor F. |
| | | SS | 4/1 | | 37-44 Mottled |
| 50 | | HHH | | | 52-53 Thin hard layers |
| | HHH | | 4/4 | | 57-55 M. dark gray clay |
| 60 | | | 5G | | 55-73 D.g.g. clay |
| | | | 4/1 | | 57 Dark brown patch |
| 70 | | | | | 63 Unclear brown patch |
| | | | | | 69 Unclear brown patch |
| 80 | | | 5GY | | 73-91 G.g. clay with F |
| | HHH | | 6/1 | | 76-91 foram rich |
| | HHH | | | | 74-76 unclear brown patch |
| | | | | | 81-82 Hard layers |
| | | | | | 82-94 unclear burrow |
| 90 | | | 5GY | | 91-98.5 M.g.g. clay with F |
| | | | 5/1 | 3667 | 91 Dark brown layer |
| 100 | | | | 1.5cm | |
| 110 | | | | | |

total length

section length

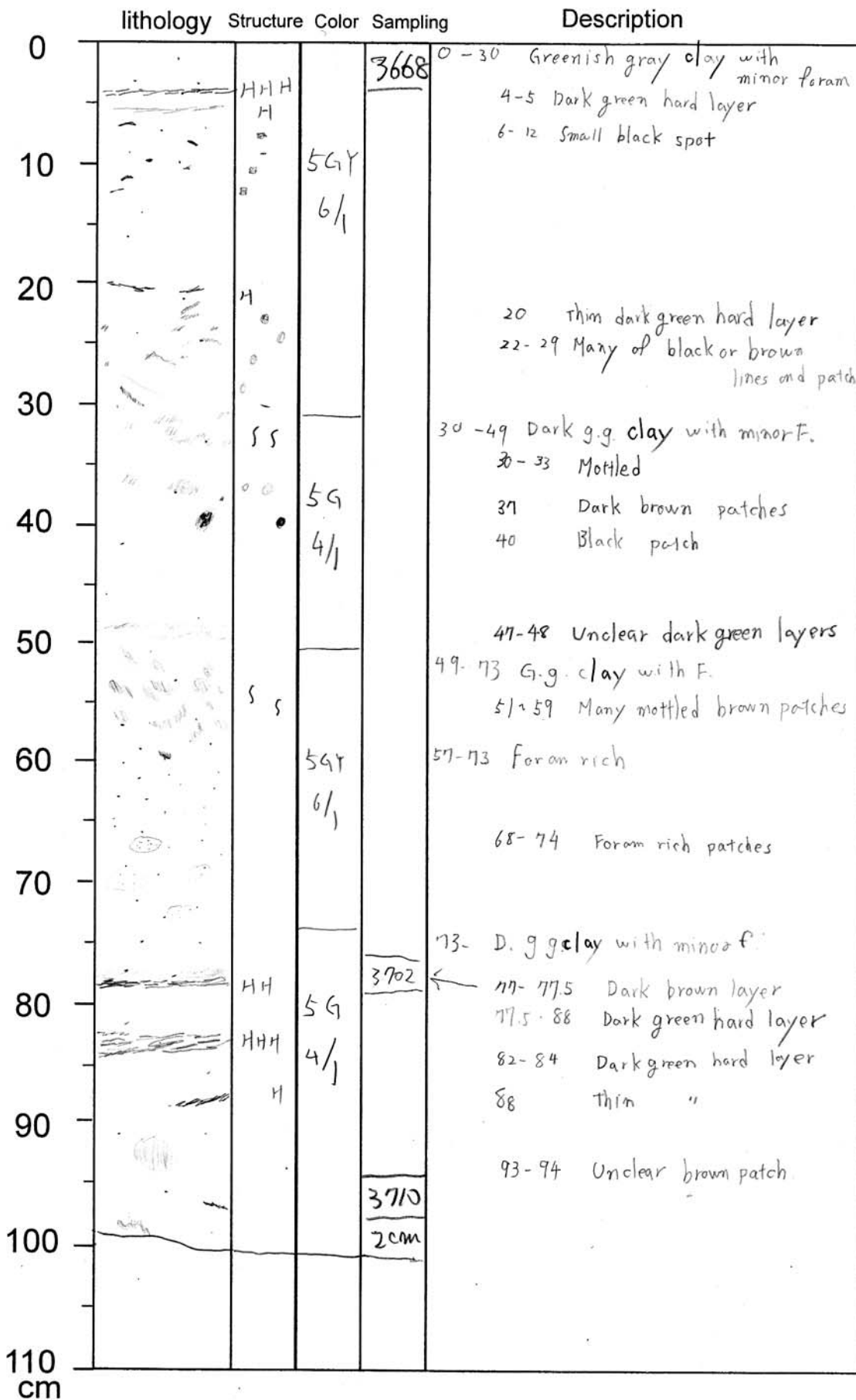
98.5

MR05-03

Date: 11/5 2005

CORE: p c 3 sec. 15

by: Suganuma



total length

section length

100

MR05-03

Date: 11/5 2005

CORE: Pc3 sec.16

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|------------|---------------------------|-----------|-------|----------|--|
| 0 | | | | | 0-19 Dark greenish gray clay with minor forams |
| 4-5 | | | | | Black line |
| 7-8 | | | | | Dark brown patch |
| 9 | | | | | Black spot |
| 16-19 | | | | | Mottled |
| 19-59 | | | | | G.g clay with forams. |
| 21-24 | | | | | Mottled |
| 25-59 | | | | | Foram rich |
| 24-28 | | | | | Black spots |
| 34 | | | | | Black spot |
| 38-39 | | | | | Black spot |
| 42 | | | | | Unclear thin dark green layer |
| 45, 48, 49 | | | | | Black spots |
| 51 | | | | | " |
| 54-58 | | | | | " |
| 59-92 | | | | | M.g.g clay with minor f. |
| 65-66 | | | | | Unclear dark brown patches |
| 70 | | | | | " |
| 78 | | | | | Black spot surrounded by dark brown line |
| 82-85 | Many black spots | | | | |
| 90-93 | Black spots | | | | |
| 92-101 | D.g.g. clay with minor f. | | | | |
| 94 | Black spot | | | | |

total length

section length

101

MR05-03

Date: 11/4 2005

CORE: PC3 17

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|------------|----------|---|
| 0 | | | | 3754 | 0-14 Dark greenish gray clay with minor foram. |
| 10 | | | 5G1 4/1 | | 6-8 Brown patches |
| 20 | | | 5G1 5/1 | | 14-23 M.g.g. clay with minor foram 19-20 Brown patches 21-22 Crak |
| 30 | | | 5GY 6/1 | | 23-47 G.g. clay with foram 23-28 Brown patches 31 " |
| 40 | | | | | 37.5-38.5 Dark green hard layer 38.5-39.0 Dark brown thin layer 43-45 Black line and spot 46-54 Dark brown spots |
| 50 | | | 5GY 5/1 | | 47-59 M.g.g. clay with foram minor 56 Dark brown line. |
| 60 | | | 5GY 6/1 | | 59-74 G.g. clay with minor foram 63-64 Dark green band 70 Black spot |
| 70 | | | | | 74-95 D.g.g. clay minor foram |
| 80 | | | 5G1 4/1 | | 85-86 Dark green patch 90-96 burrow |
| 90 | | | | | |
| 100 | | | 5GY 6/1 | 3794 | 95- G.g. clay with foram 96- many brown patches |
| 110 cm | | | | | |

total length

section length

101

MR05-03

Date: 11/5 2005

CORE: Pc 3 sec 18

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-------------------------------|-----------|-------|------------------------|---|
| 0 | [Hand-drawn lithology sketch] | SS | 5GY | 1cm 3797 | 0-5 Greenish gray clay with minor foram |
| | | | 6/1 | | 2-13 mottle |
| 10 | [Hand-drawn lithology sketch] | SS | 5GY | | 5-13 Dark greenish gray with minor f. |
| | | | 4/1 | | 13-41 G.g. clay with minor f. |
| 20 | [Hand-drawn lithology sketch] | □ | 5GY | | 16-23 Burrow |
| | | | 6/1 | | 20 Thin dark gray hard layer |
| 30 | [Hand-drawn lithology sketch] | □ | | | 25-26 Brown patches |
| | | | | | 28 " |
| 40 | [Hand-drawn lithology sketch] | □ | | | 30 Black spot |
| | | | | | 34-36 Thin dark green band |
| 50 | [Hand-drawn lithology sketch] | □ | | | 39-40 Black spot. |
| | | | | | 41 or 42 - 44 DG.g. clay with minor f. |
| 60 | [Hand-drawn lithology sketch] | □ | 5G | | 42-47 Burrows |
| | | | 4/1 | | 50 Thin dark green layer. |
| 70 | [Hand-drawn lithology sketch] | □ | | | 61-63 Unclear brown patches |
| | | | | | 64-66 Dark brown line |
| 80 | [Hand-drawn lithology sketch] | □ | 5GY | | 71-75 Mottled |
| | | | 7/1 | | 72-77 Burrows |
| 90 | [Hand-drawn lithology sketch] | □ | | | 74-90 light G.g. clay with f. |
| | | | | | 80 Dark green band |
| 100 | [Hand-drawn lithology sketch] | SS | 5GY | | 90-100 M.g.g. clay with minor f. |
| | | | 5/1 | 3838 7.5cm | 94-99 Burrow |
| 110 | | | | | 94-100 Mottled |

total length

section length

100

MR05-03

CORE: P03 sec. 19

Date: 11/4 2005

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|------------|---|
| 0 | | HH HHH | | 3839 | 0-38 Dark greenish gray clay with minor forams 3-5 Thin dark green layers |
| 10 | | | | 5GY 4/1 | |
| 20 | | | | | 23-24 Dark brown lines |
| 30 | | | | | 27-28 Dark green patch |
| 40 | | | | | 34 Dark brown line |
| 50 | | | | 5GY 5/1 | 38-68 M.g.g. clay with p. |
| 60 | | | | | 45 Dark brown line |
| 70 | | | | | 52-53 Black spots |
| 80 | | | | 5GY 4/1 | 57-59 Black spots |
| 90 | | | | | 64 Black spot |
| 100 | | SS | | 3882 | 66 Dark green patch |
| 110 | | | | | 68-100 D.g.g. with rarely p. |
| | | | | | 70 Black patch |
| | | | | | 74-76 weakly mottled. |
| | | | | | 81 Black spots |
| | | | | | 89-90 Brown line |
| | | | | | 94-98 Mottled |

total length

section length

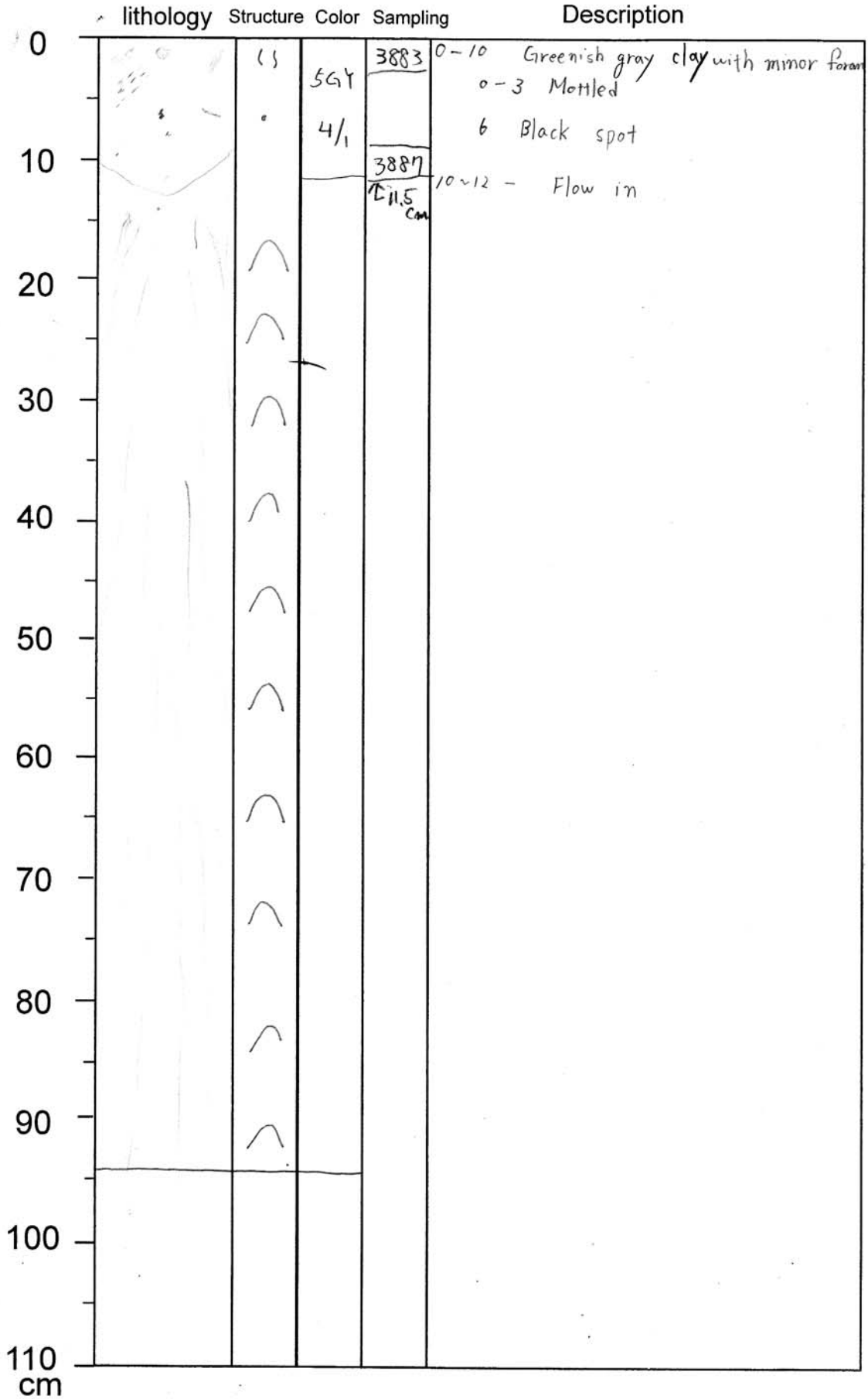
100

MR05-03

Date: 11/5 2005

CORE: PC3 sec 20

by: Suganuma



total length _____ section length 94

MR05-03

Date: 11/7 2005

CORE: PL-03

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|-------|----------|---|
| 0 | | | | 10YR 4/2 | 0-5 Dark yellow brown clay with forams 3-4 Brown patch |
| 10 | | | | 10YR 5/4 | 5-14 Moderate yellowish brown forams rich clay |
| 20 | | | | 10YR 4/2 | 14-36 Dark yellow brown clay with F. 20-36 Heavily mottled |
| 30 | | | | | |
| 40 | | | | 5G 4/2 | 36-40 Dusky yellow green clay 36 thin green layer |
| 50 | | | | 5G 4/1 | 40-53 Dark greenish gray clay 38-50 Disturbed |
| 60 | | | | 10YR 4/2 | 53-62 Dark yellow brown clay 57-60 Mottled |
| 70 | | | | 5G 5/2 | 62-66 Dusky yellow green clay 64 Thin olive green layer |
| 80 | | | | | |
| 90 | | | | | |
| 100 | | | | | |
| 110 cm | | | | | |

re?
sampled

total length

section length

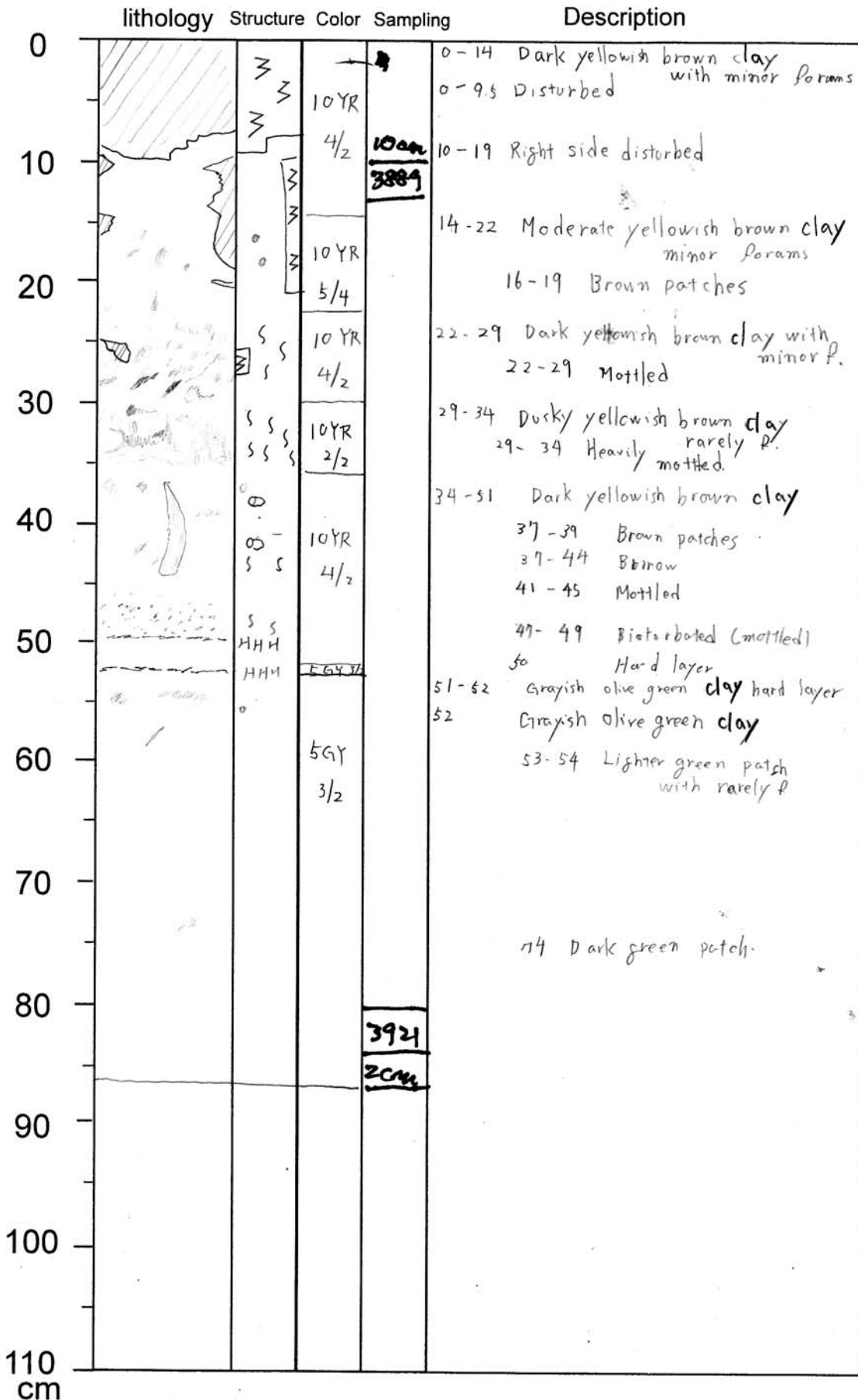
66

MR05-03

Date: 11/5 2005

CORE: PC 4 sec. 1

by: Suganuma



total length

section length

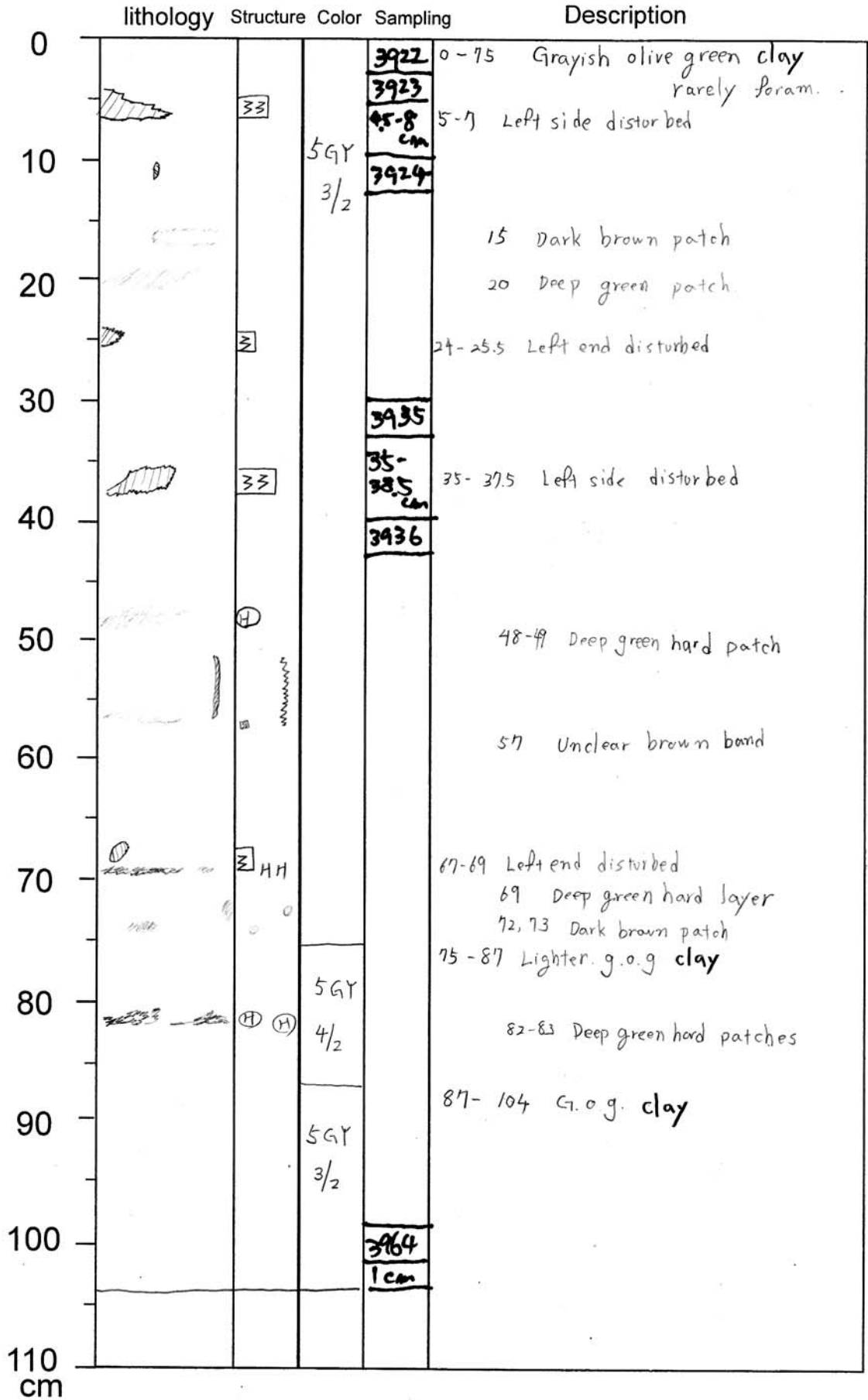
86.5

MR05-03

Date: 11/4 2003

CORE: P c 4 sec 2

by: Suganuma



total length

section length

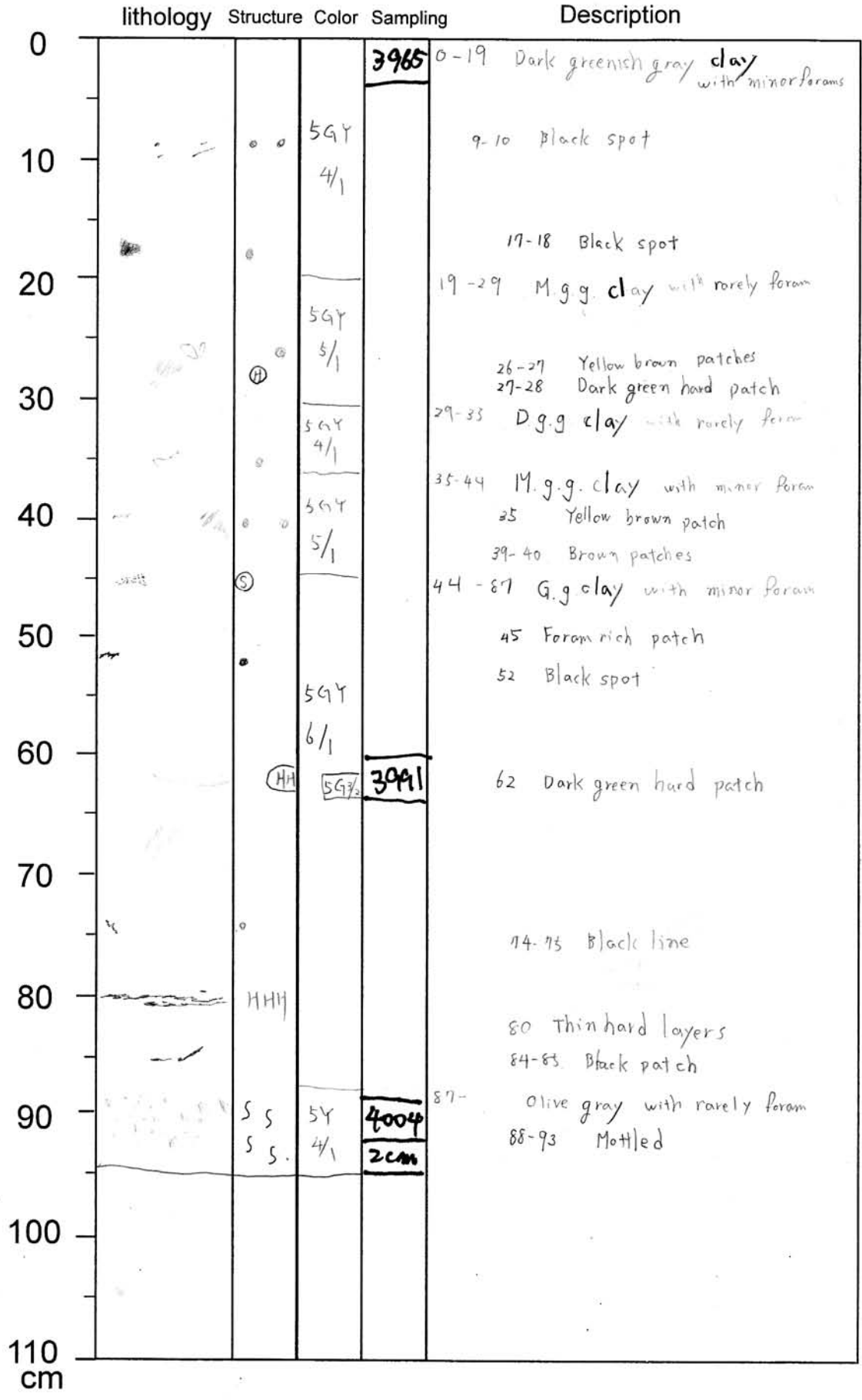
104

MR05-03

Date: 11/6 2005

CORE: PC4 sec.3

by: Suganuma



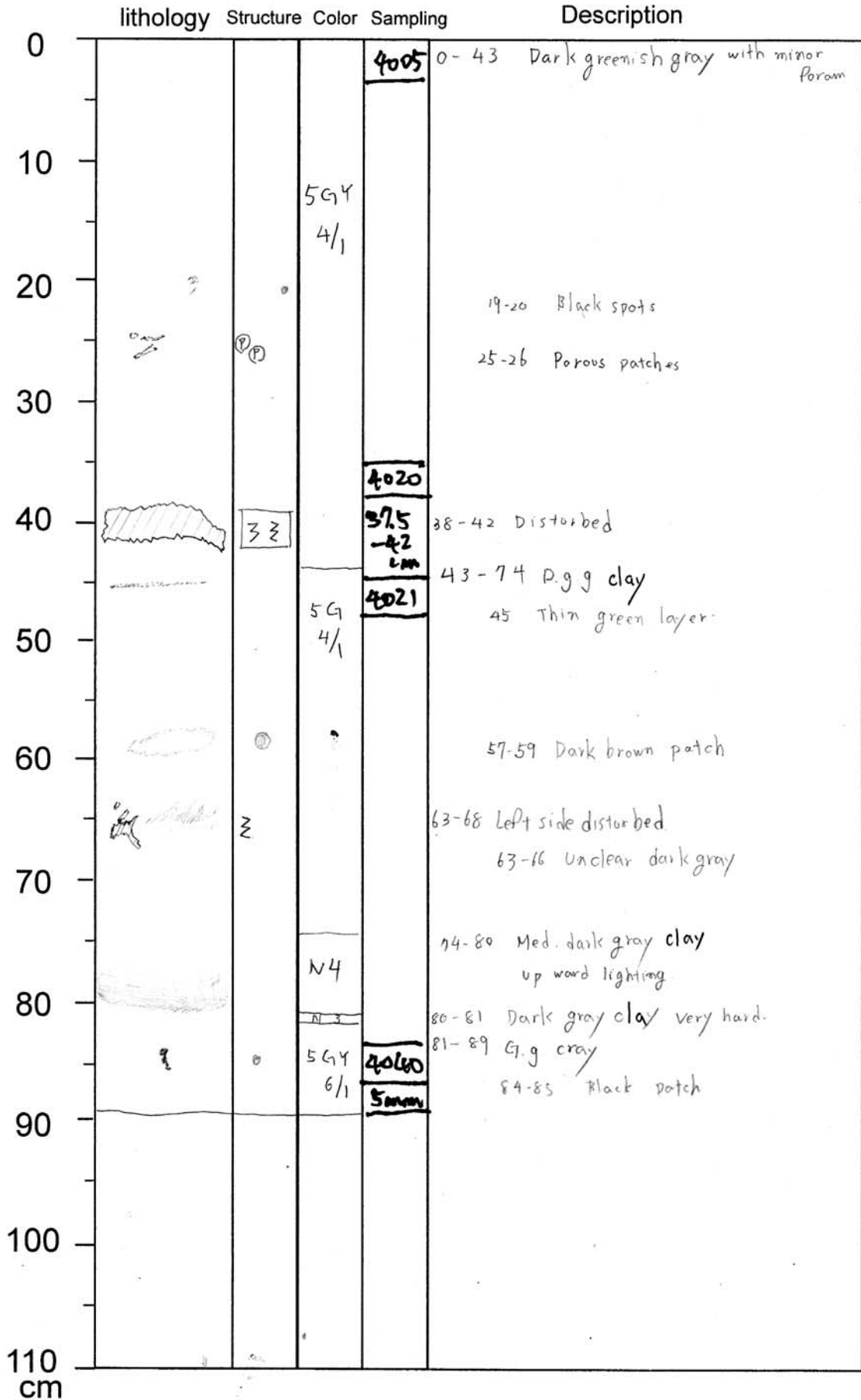
total length _____ section length 94.5

MR05-03

Date: 11/6 2005

CORE: PC4 sec.4

by: Suganuma



total length

section length

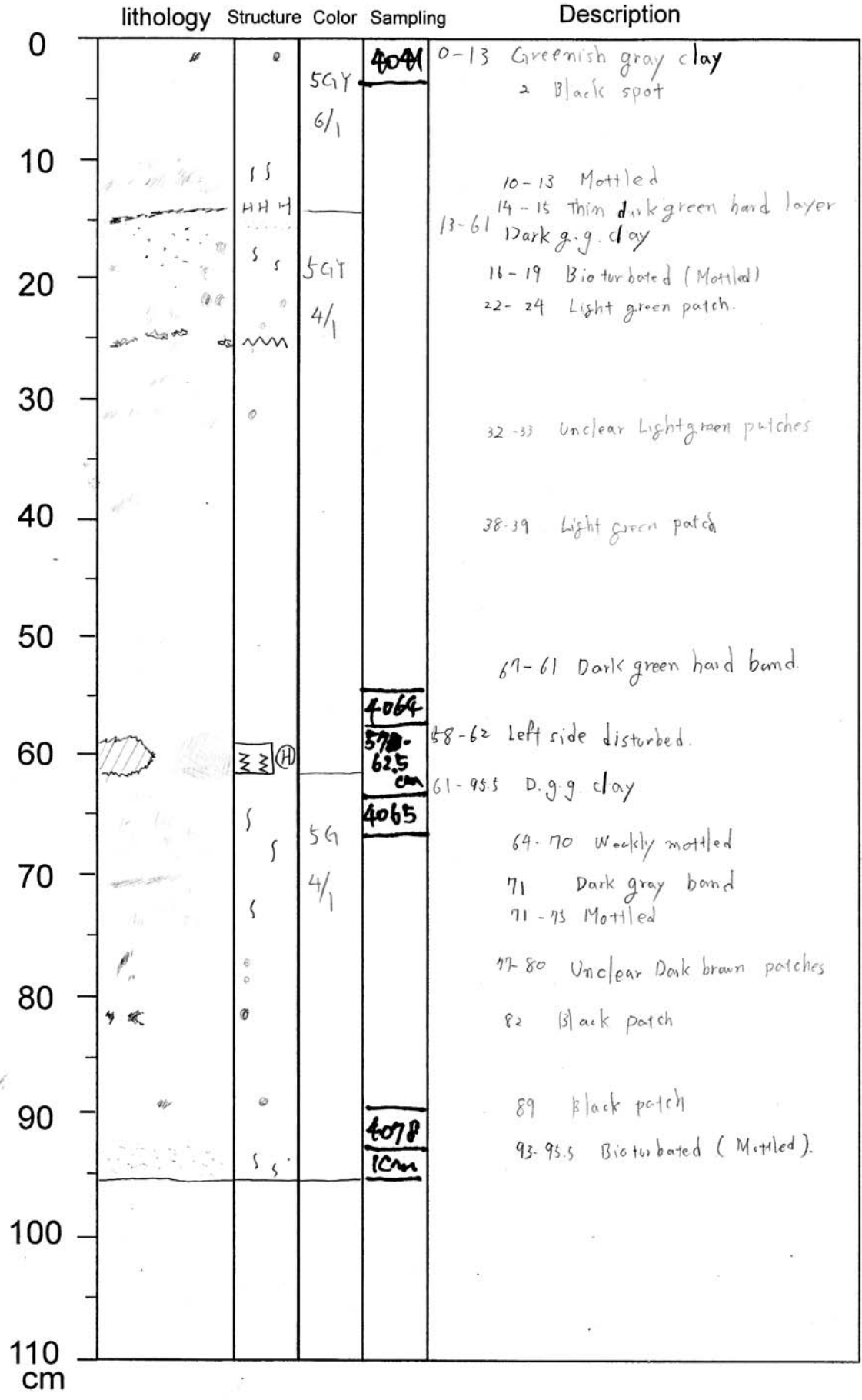
89

MR05-03

Date: 11/5 2005

CORE: PC 4. sec. 5

by: Suganuna



total length

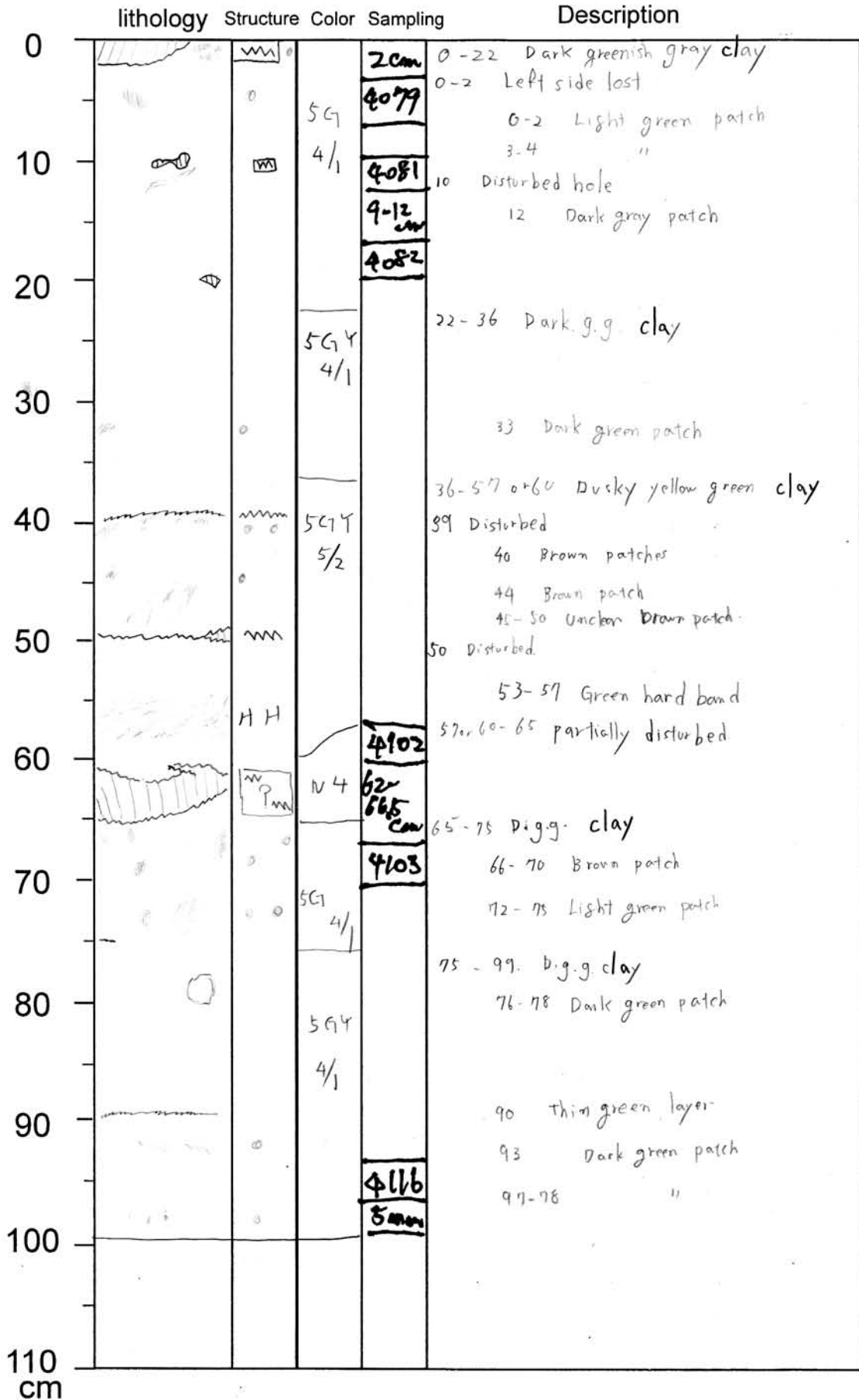
section length 95.5

MR05-03

Date: 11/6 2005

CORE: PC4 sec. 6

by: Suganuma



total length

section length

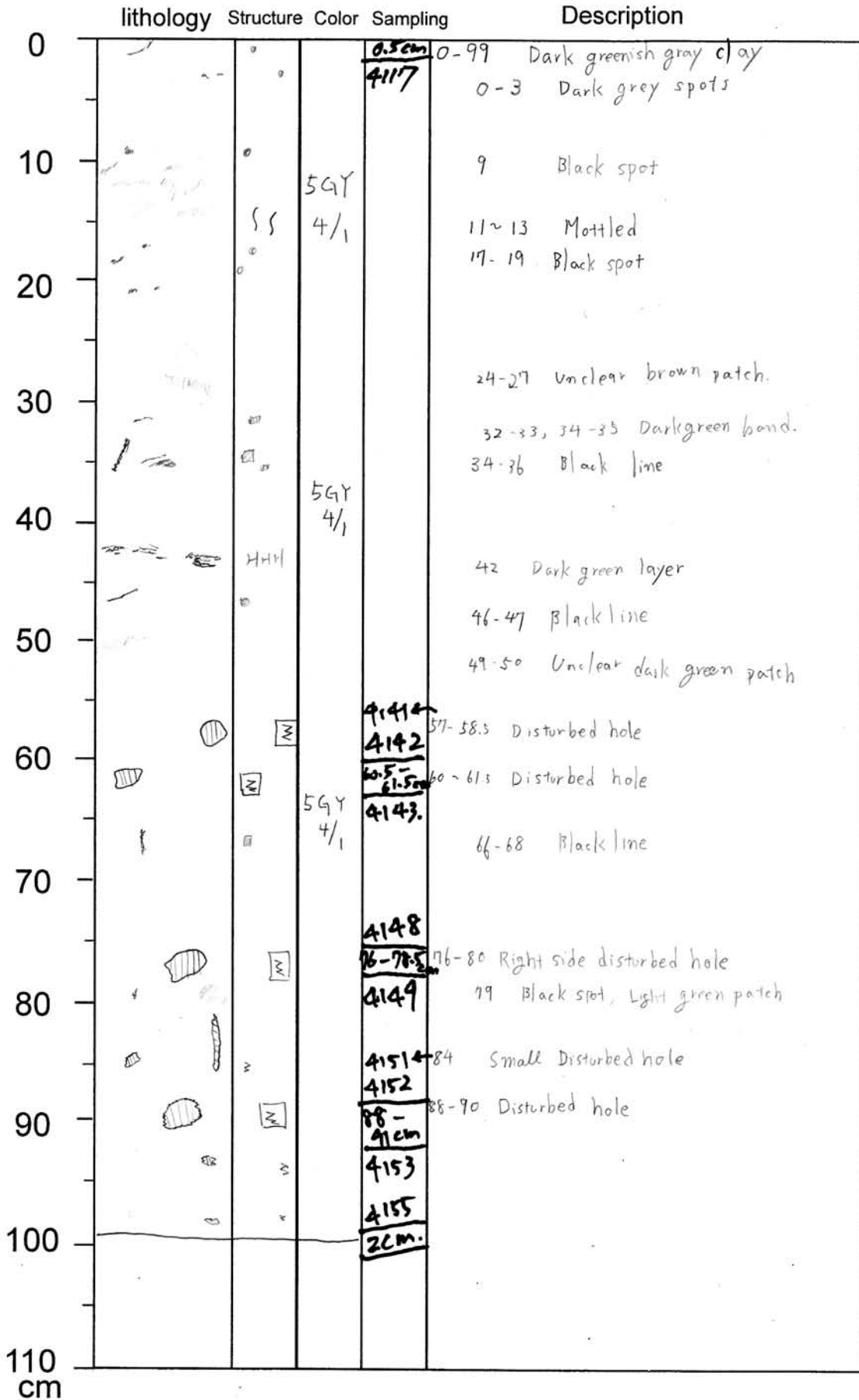
99

MR05-03

Date: 11/5

CORE: PC4 sec 7

by: Suganuma



total length

section length

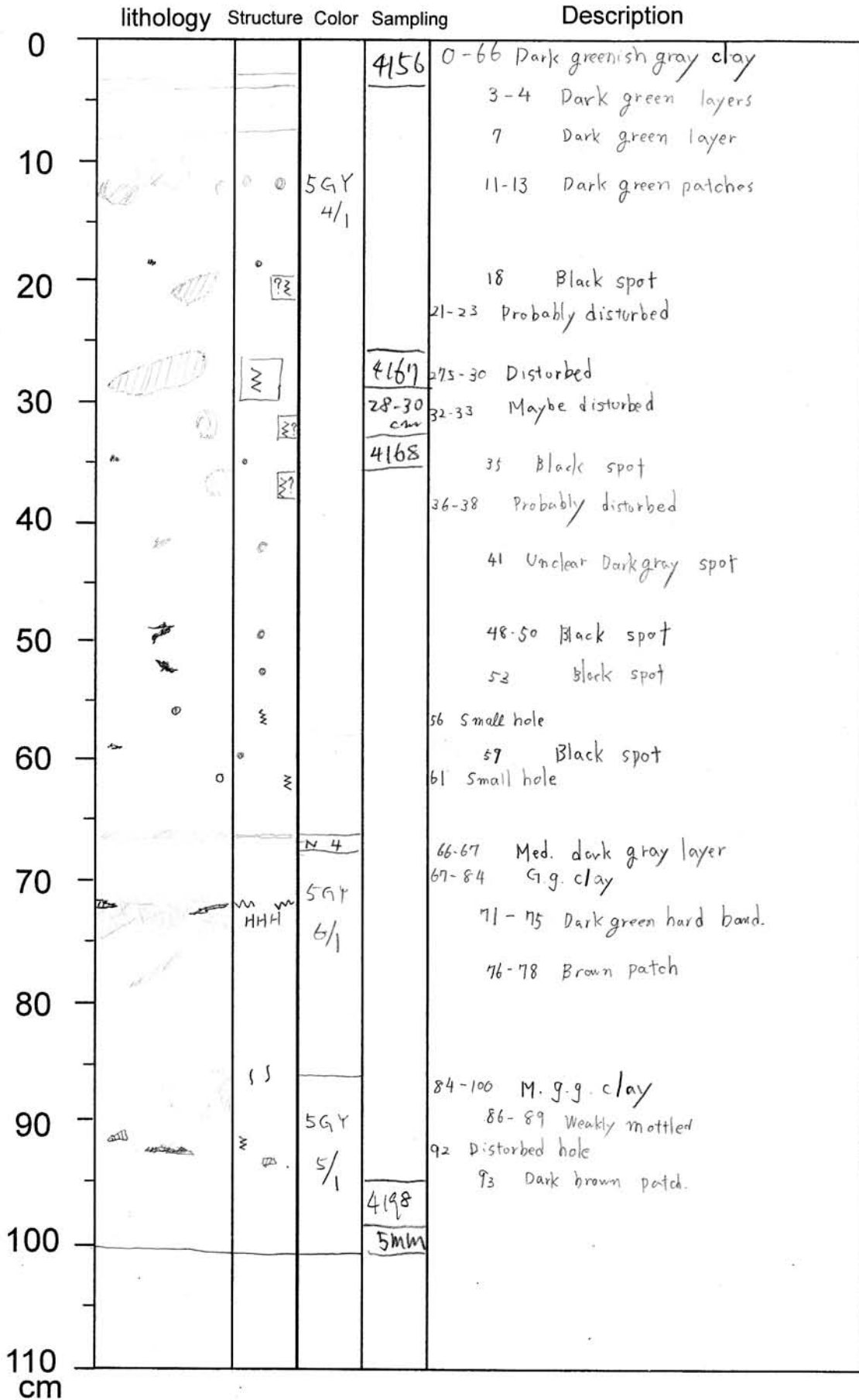
99

MR05-03

CORE: PC4 sec.8

Date: 11/5 2005

by: Suganuma



4174M
落下

total length

section length

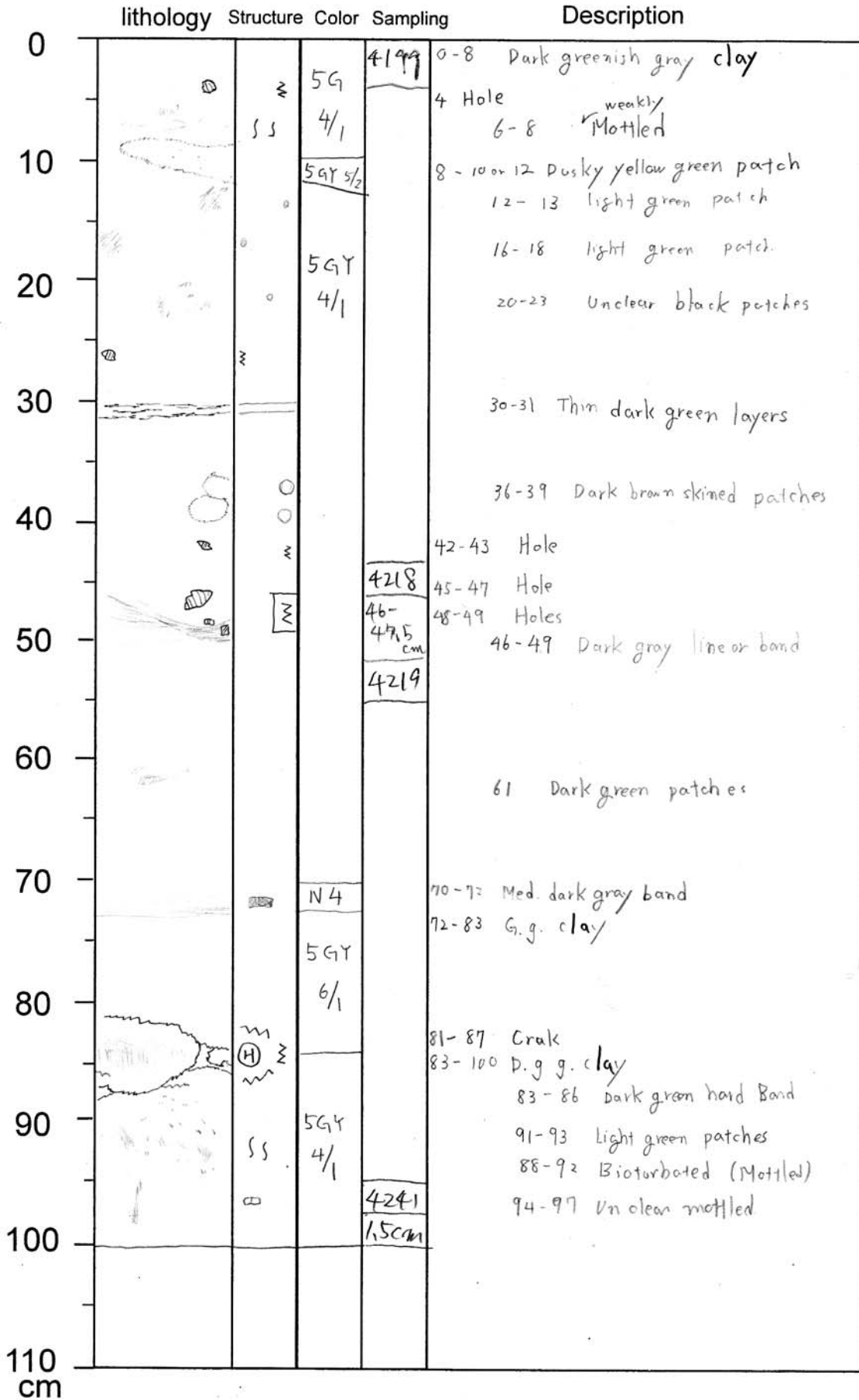
100

MR05-03

Date: 11/6 2005

CORE: PC4 sec 9

by: Soganuma



total length

section length

100

MR05-03

Date: 11/5⁶ 2005

CORE: PC4 Sec 10

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|------------|-------------------|---|
| 0 | | | | 4242 | 0-10 Dark greenish gray clay 1 Black line |
| | | | 5GY 4/1 | | |
| 10 | | S S | | 4248 | 10-26 G.g. clay 10-14 Mottled |
| | | | 5GY 6/1 | | |
| 20 | | W | | 16.5 -20 cm | 16-19.5 Left side disturbed hole 14-20 deformed? 14-20 elongated brown patch 19-24 Brown patches |
| | | | 5GY 5/1 | 4249 | |
| 30 | | H H H | | | 26-30 M.g.g. clay 26 Black spot 29 Dusky green layer |
| | | | 5GY 3/2 | | 30-33 Dusky green hard patch |
| | | | 5GY 5/1 | | 33-38 M.g.g. clay |
| 40 | | | N4 | | 38-40 Med. dark gray band |
| | | | 5GY | | 40-65 D.g.g. clay |
| 50 | | | 4/1 | | 42-49 Burrows 46-49 Light patches |
| 60 | | S S | | | 55-60 Weakly mottled |
| | | | N4 | | 63-65 Dusky green layers |
| 70 | | | 5GY 4/1 | | 65-67 Med. d.g. band 67-83 D.g.g. clay |
| | | | | | 70-71 Light green patch |
| 80 | | | | | 74-78 Burrow? 77-83 Black spots or lines |
| | | | 5GY 5/1 | | 83-100 M.g.g. clay |
| 90 | | | | 4282 | 86 Black spot 89 Brown patches |
| 100 | | | | 1cm | |
| 110 cm | | | | | |

total length

section length 100.5

MR05-03

CORE: PC4 sec 11

Date: 11/16⁶ 2005

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|-------|-------------|---|
| 0 | | (HH) | | 5G 4/1 | 0-5 Dark greenish gray clay |
| | | | | 1cm 4283 | 4-5 Thin green layers 6-4 Hard patch |
| 10 | | | | 5GY 4/1 | 5-44 D.g.g. clay 6-9 Light green patch 11 Black 15 Light green patch |
| 20 | | | | | 20 Black spot 22-28 weakly mottled |
| 30 | | | | | 29 Dusky green layer 30 Black spots |
| 40 | | | | | 37-40 Many of black spots 41-42 " |
| 50 | | | | 5GY 5/1 | 44-49 M.g.g. clay 48 Brown spot |
| | | | | 5GY 6/1 | 49-56 G.g. clay 50-55 Unclear brown patches |
| 60 | | | | | 56-57 Med. dark gray band 57-80 G.g. clay |
| 70 | | (H) | | 5GY 6/1 | 63-65 Dusky green hard patch 60-69 Unclear burrow |
| 80 | | (H) | | 5GY 4/1 | 79-80 Dusky green hard patch 80-101 D.g.g. clay |
| | | | | | 80-88 Bioturbated (Mottled) 84-90 Unclear burrow |
| 90 | | | | | 89-91 Light green patches 93-97 " |
| 100 | | | | 4326 3mm | |
| 110 cm | | | | | |

total length

section length

101

MR05-03

Date: 11/5 2005

CORE: PC4 Sec 12

by: Suganuma

| | lithology | Structure | Color | Sampling | Description | | | |
|-------|-----------|-----------|--|---------------------------------------|--|--|--|---------------------|
| 0 | | | 5GY 4/1 5GY 5/1 5GY 6/1 5GY 4/1 | 050 4727 | 0-22 Park greenish gray clay 1-5 Light green patches 8-9 Dark gray band 10-12 Disturbed | | | |
| 10 | | | | | | | | |
| 20 | | | | | | | | 22-41 M. g.g. clay |
| 23-24 | | | | | | | | Dark gray band |
| 25-27 | | | | | | | | Brown patches |
| 32 | | | | | | | | Dusky green patches |
| 36-40 | | | | | | | | Burrow |
| 41-46 | | | | | | | | G.g. clay |
| 41 | | | | | | | | Brown patch |
| 45 | | | | | | | | " |
| 50 | | | | 478 52-54 cm 4749 | 52-54 Disturbed 54-58 Light green patch | | | |
| 60 | | | | | 62 Black spot | | | |
| 70 | | | | | 70 Black spot | | | |
| 80 | | | | | 76-99 D.g.g. clay | | | |
| 76-83 | | | | | Bioturbated (Mottled) | | | |
| 84-87 | | | | | Weakly bioturbated | | | |
| 83 | | | | | Hole | | | |
| 95-99 | | | | | Mottled. | | | |
| 100 | | | | 4367 75cm | | | | |

total length

section length

99

MR05-03

Date: 11/86 2005

CORE: PC4 Sec. 13

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|--|--|----------|---|
| 0 | | S O S S S S S S S S S S | 5GY 4/1 5GY 6/1 5GY 4/1 5GY 4/1 5GY 6/1 | 4368 | 0-14 D.g.g. clay 1-6 Burrow 1-8 Mottled 13.5 Thin dusty gray layer 14-39 G.g. clay 15-19 Brown patches |
| 10 | | | | | 24-26 Hole surrounded by black matter |
| 20 | | | | | 30 Brown patch |
| 30 | | | | | 35-37 Brown patch |
| 40 | | | | | 39-85 D.g.g. clay 39-41 Unclear light green patch |
| 50 | | | | | 48-49 Hole 50-55 Bioturbated (Mottled) 56-57 Light green patch |
| 60 | | | | | 65-68 Unclear dark gray band |
| 70 | | | | | 69 Hole 72-73 Hole |
| 80 | | | | | 79-80 Hole 79-84 Mottled |
| 90 | | | | | 85-87-100 G.g. clay 84-87 Brown patch 88-92 Burrow 93-94 Brown patch 96 Brown patch |
| 100 | | | | 4410 | |
| 110 cm | | | | | |

total length

section length

99

MR05-03

Date: 11/8 2005

CORE: PC 4 sec. 14

by: Sugamni

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|-------|-----------------|---|
| 0 | | SS | | 4411 | 0-14 Greenish gray clay |
| | | | | | 0-4 Mottled |
| | | | | | 5-10 Burrow |
| 10 | | | | | 10-13 Mottled |
| | | HH | | 10GY 3/2 | 14-16.5 Dusky yellowish green hard band |
| | | | | N4 | 16.5-20 Med. dark gray layer |
| 20 | | | | | 20-60 |
| | | | | | 21-27 Burrows |
| | | | | | 29-33 Bioturbated (Mottled) |
| | | | | | 35-39 Bioturbated (mottled) |
| 30 | | | 5GY | | |
| | | | 4/1 | | |
| 40 | | | | | |
| 50 | | | | 46-48 Disturbed | |
| 60 | | (H) | | N4 | 58-60 Dusky green hard patch |
| | | | | | 60-62 Med. d.g. layer |
| | | | | | 62-93 G.g. clay |
| 70 | | | 5GY | | 62-75 Mottled and Burrows |
| | | | 6/1 | | 77-87 Heavily bioturbated (Mottled) |
| 80 | | | | | |
| 90 | | | | 4451 | 91-94 fine ~ m. size sand |
| | | | | 20cm | upward pining |
| | | | | N3 | 93-95 Dark gray clay |
| 100 | | | | | |
| 110 cm | | | | | |

total length

section length

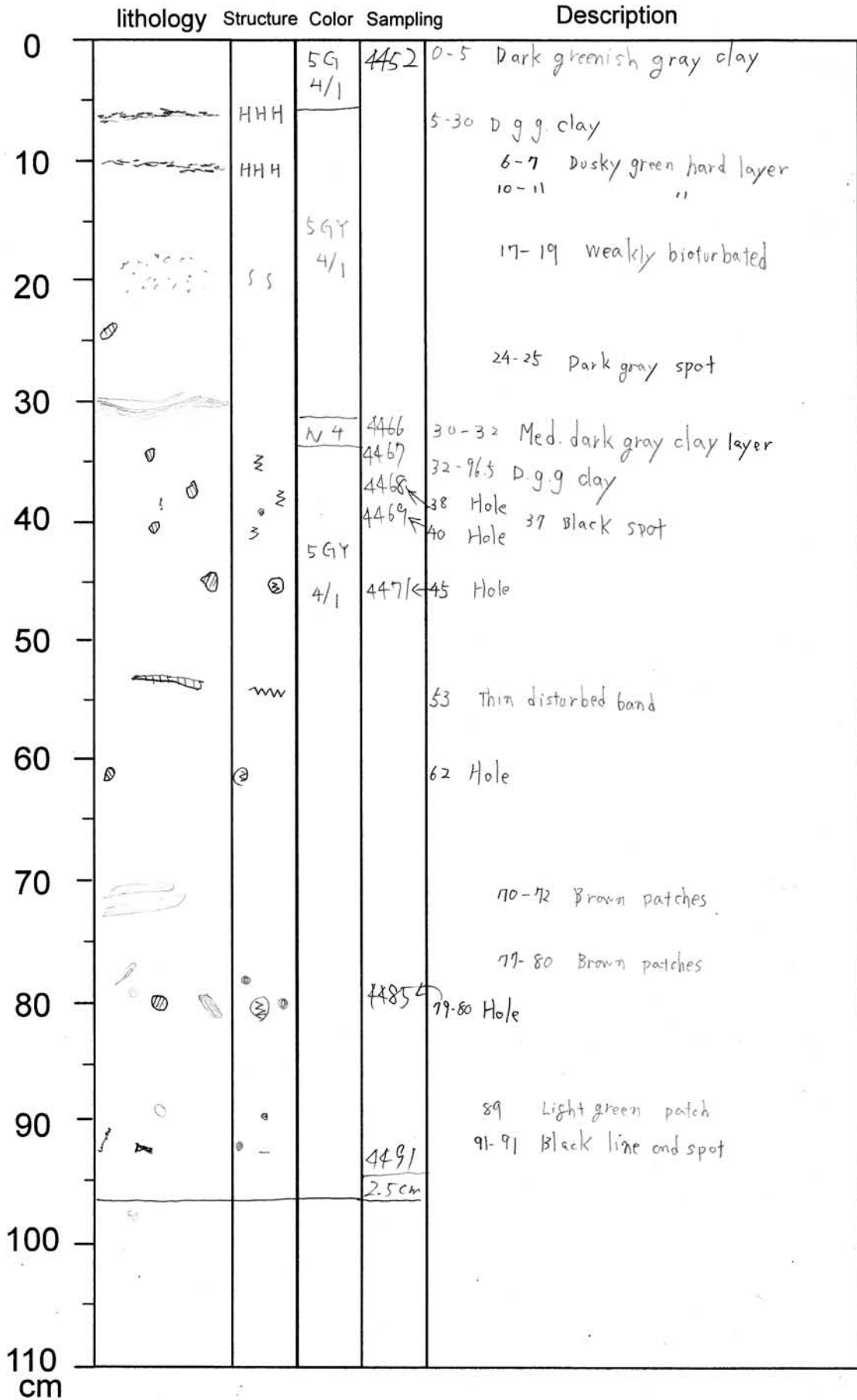
95

MR05-03

Date: 11/6 2005

CORE: Pc4 sec. 13

by: Suganuma.



total length

section length

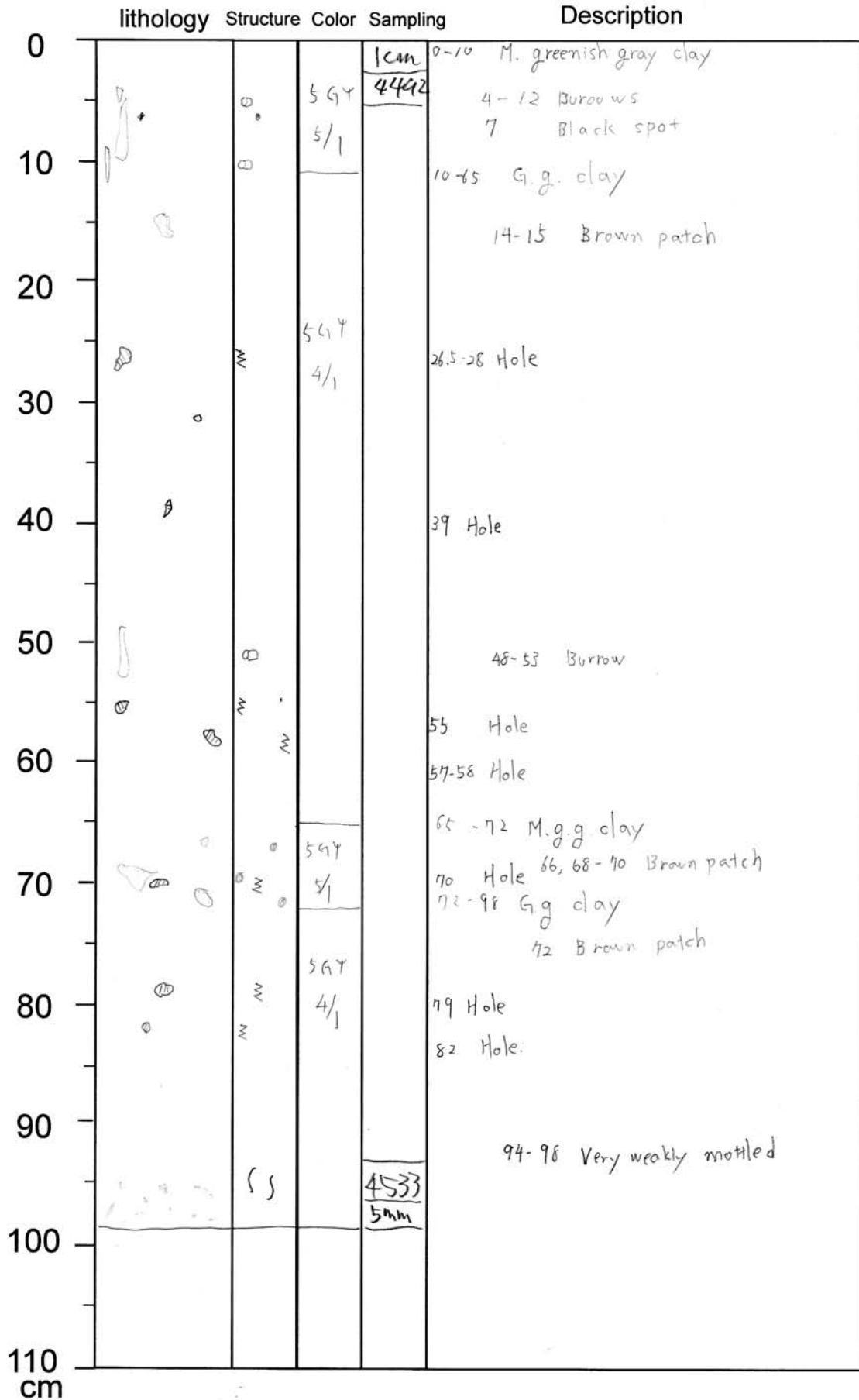
96.5

MR05-03

Date: 11/7 2005

CORE: Pc 4 sec. 16

by: Suganuma



total length

section length

98

MR05-03

Date: 11/7 2005

CORE: pc4 sec 17

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-------------------------|------------|---------------|---|
| 0 | | SS | 5GY 6/1 | 4534 | 0-12 Greenish gray clay 0-5 Mottled |
| 10 | | HHH | 5GY 3/2 | | 12-16 Grayish olive green hard clay |
| 20 | | — | N3 | | 16-17 Dark gray band |
| 20 | | S S S S | 5GY 4/1 | | 18-26 G.g. clay 17-27 Burrows and bioturbation |
| 30 | | • • | | | 30-35 Light green patch |
| 40 | | z z S S | 5GY 5/1 | | 36-49 M.g.g. clay 40-44 Bioturbated (Mottled) |
| 50 | | S S | 5GY 4/1 | | 49-60 D.g.g. clay 50-54 Bioturbated |
| 60 | | HHH HH | | | 53.5-57 Dusky green hard layer |
| 60 | | — | N4 | | 59.5-60 M. dark green band |
| 70 | | • • z z HH HHH | 5GY 4/1 | | 62-81 D.g.g. clay 66-68 Brown patches 71.5-74 Thin dusky green layers |
| 80 | | S S | 5GY 5/1 | | 81-91 M.g.g. clay 82-90 Bioturbated |
| 90 | | • | 5GY 4/1 | 4574 1.5cm | 91-96 D.g.g. clay 92 Black spot |
| 100 | | | | | |
| 110 cm | | | | | |

total length

section length

96

MR05-03

Date: 11/17 2005

CORE: Pc 4 18 w

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|------------|----------------|--|
| 0 | | S | 5GY 6/1 | 4575 | 0-3 Greenish gray clay |
| 3 | | S | | | 3-13 Dark g.g. clay 1-7 Mottled |
| 10 | | S | 5GY 4/1 | | |
| 13 | | S | | | 13-26 G.g. clay 13, 14-17 Brown patch 14-29 Bioturbated |
| 20 | | S | 5GY 6/1 | | |
| 26 | | S | | | 26-30 M.g.g. clay |
| 30 | | S | 5GY 5/1 | | |
| 30 | | S | | | 30-45 G.g. clay 31-42 Burrow 32-35 Bioturbated 37-39 Bioturbated |
| 40 | | S | 5GY 6/1 | | |
| 45 | | S | | | 45-98.5 D.g.g. clay 45-47 Bioturbated 49 Light green patches 51 Black patch 56 Light green patch |
| 50 | | S | 5GY 4/1 | | |
| 65 | | S | | | 65 Black spot |
| 70 | | S | | | 67 Brown patch 70 " |
| 90 | | S | | | 90 Brown patches |
| 100 | | | | 4615. 0.5cm | |
| 110 cm | | | | | |

total length

section length

98.5

MR05-03

Date: 11/17 2005

CORE: PC4 19w

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|--------|-----------|-----------|------------|------------------------|--|
| 0 | | | | 450 4616 | 0-28 Dark greenish gray clay |
| 10 | | | 5GY 4/1 | | 11-14 Unclear light green patches 19-20 Unclear dusty green band |
| 20 | | | | | 25-26 Brown patch |
| 30 | | | 5GY 5/1 | | 28-36 M g.g. clay 28-30 Brown patches |
| 40 | | HHH | N= | | 36-37 Grayish black band 37-81 D.g.g. clay |
| 50 | | HHH | 5GY 4/1 | | 39 Dusky green layer 40-44 Burrow 46 Dusky green layer 48 Hole 52 Black spot |
| 60 | | | | | 60-63 Unclear light green patch |
| 70 | | | | | 70-71 Black spot |
| 80 | | | 5GY 6/1 | | 75-78 Burrows 80-83 Burrows 81-99.5 G.g. clay |
| 90 | | HH | | | 88-89 Black patch 90-91 Dusky green layer |
| 100 | | | | 4658 | 93 Brown patches 96-98 Brown patches 97 Black spot |
| 110 cm | | | | | |

total length

section length

99.5

MR05-03

Date: 11/7 2005

CORE: pc4 sec. 20

by: Suganuma

| | lithology | Structure | Color | Sampling | Description |
|-----|-----------|-----------|-------|----------|-----------------------------------|
| 0 | | | | 4659 | 0-15.5 Greenish gray clay |
| | | | | | 3.5 Dusky green layer |
| | | | 5G4 | | 6 Black spot |
| 10 | | HH | 6/1 | | 8 " |
| | | S S | | | 8 Dusky green hard band |
| | | | | | 11 Black spot |
| | | | | | 12-15.5 Bioturbated |
| | | | | 104 | 15.5-17.5 Med. dark gray band |
| 20 | | S S | | | 17.5-27.5 Dark greenish gray clay |
| | | S S | 5G4 | | 18-24 Bioturbation |
| | | S S | 4/1 | | 20-23 Light green patch |
| | | S S | | | 25 Black spot |
| 30 | | | | | 25-27 Bioturbation |
| | | | | | 27.5-62 M.g.g. clay |
| | | | | | 31-33 Brown patch |
| 40 | | | 5G4 | | |
| | | | 5/1 | | |
| 50 | | SS | | | 47-49 Bioturbation weakly |
| | | HH | | | 50 Thin dusky green layer |
| | | S S | | | 53-55 weakly Bioturbated |
| 60 | | | | | |
| | | | | | 61 Black spot |
| | | | | | 62-75 D.g.g. clay |
| | | | 5G4 | | 62 gray band |
| 70 | | | 4/1 | | |
| | | | | | 74-76 Bioturbation |
| | | S S | 5G4 | | 75-80 M.g.g. clay |
| | | | 5/1 | | 79-83 Burrows |
| 80 | | | 5G4 | | 80-93 D.g.g. clay |
| | | | 4/1 | | |
| 90 | | | | 4698 | 86 Light green patch |
| | | | | 2cam | |
| 100 | | | | | |
| 110 | | | | | |
| cm | | | | | |

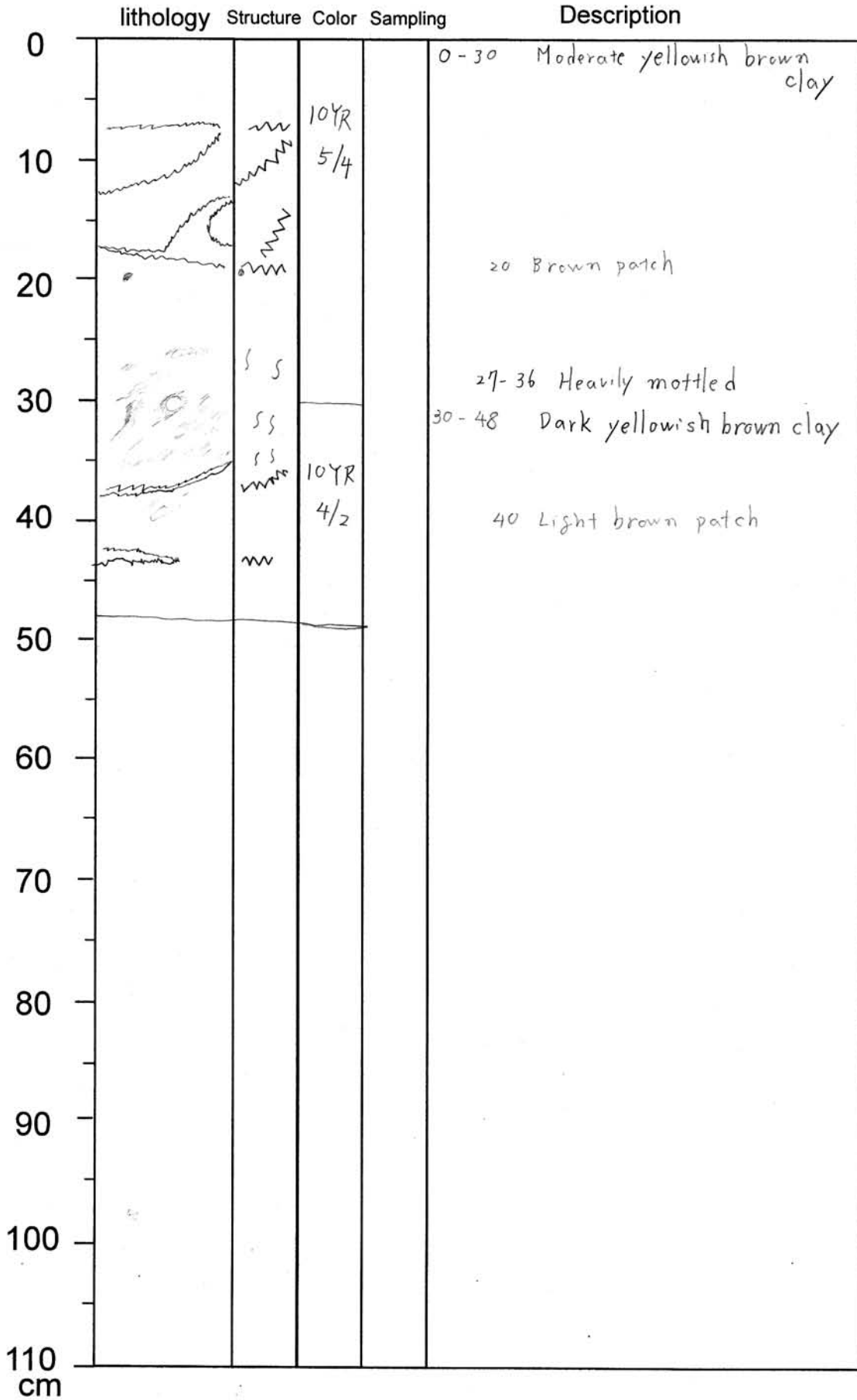
total length _____ section length 93

MR05-03

CORE: PL-4W

Date: 11/7 2005

by: Suganuma



total length

section length 48