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Onboard Report

of

the R/V *Natsushima*/ROV *Hyper-Dolphin* Cruise

in Sagami Bay (NT12-22)

August 21 – August 25, 2012

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

Abstract

<IMPACTO III>

To elucidate faunal succession and decomposition process of a whale carcass, an ROV diving research was conducted in Sagami Bay. A baby sperm whale (5 m in total length) was submerged at a depth of 500 m in the bay on June 8, 2012. Most soft tissues were consumed within 2.5 months from the deployment. Most dominant consumers were eels and crustaceans from the ROV observations. For long-term observations and analyses, four time-lapse cameras, two sediment traps and three current profilers were retrieved around the carcass. Additionally, a sunken humpback whale carcass, which was deployed by a local government, was observed.

<KOOHOO III>

This dive was performed along the west wall of the unnamed submarine canyon, one of the branches of the Nojima canyon, in the So-o Trough. Dive started at the junction of the two canyons and later proceeded along the wall of the unnamed canyon. We observed thick sediments transported by turbidity currents from land at the center of the canyon, eroded surface of the basement sedimentary rocks of the canyon wall. During the dive we collected 7 rocks (Mud stone, conglomerate), 4 push cores and 10 organisms.

Cruise Information

Cruise ID: NT12-22

Name of vessel: R/V Natsushima/ROV Hyper-Dolphin 3000

Title of the cruise: IMPACTO (IMPlantation of Animal Carcasses for Time-series Observations) III & KOOHOO III

Title of proposal: Implantation of animal carcasses for time-series observations KOOHOO III

Cruise period: August 21, 2012 - August 25, 2012

Chief scientist [Affiliation]: Yoshihiro FUJIWARA [JAMSTEC]

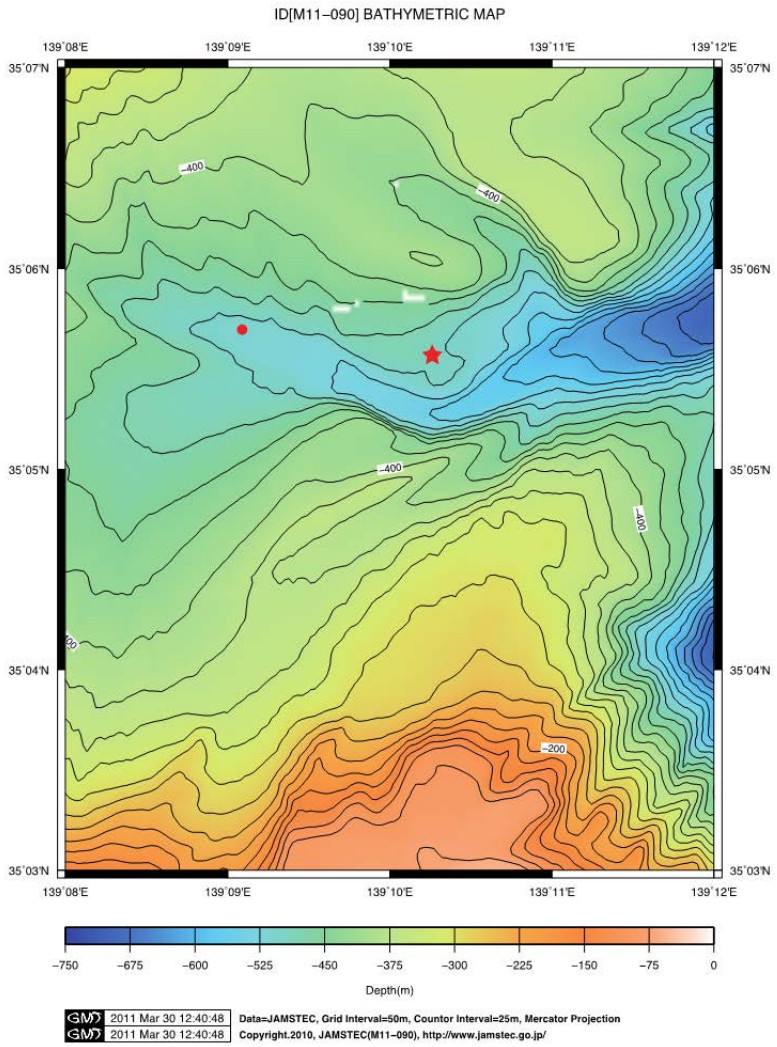
Representative of the Science Party [Affiliation]: Yoshihiro FUJIWARA [JAMSTEC]
Kyohiko MITSUZAWA [JAMSTEC]

Ports of call: from JAMSTEC port (Yokosuka) to JAMSTEC Port (Yokosuka)

Research area: Sagami Bay, off Boso Peninsula

Research map:

<IMPACTO III> Dive site is shown as ★(sperm whale) and ● (humpback whale).



Participants aboard

1-1. Research group

課題 JS12-33「鯨骨生態系の遷移初期の解明　～巨大沈降粒子と深海鮫～」参加者

藤原　義弘　（FUJIWARA, Yoshihiro）
　　海洋研究開発機構　海洋・極限環境生物圏領域

河戸　勝　（KAWATO, Masaru）
　　海洋研究開発機構　海洋・極限環境生物圏領域

宮崎　征行　（MIYAZAKI, Masayuki）
　　海洋研究開発機構　海洋・極限環境生物圏領域

棚田　詢　（TANADA, Jun）
　　海洋研究開発機構　海洋・極限環境生物圏領域

永堀　淳志　（NAGAHORI, Atsushi）
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大西　雄二　（ONISHI, Yuji）
　　岡山大学大学院　自然科学研究科

小林　はるな（KOBAYASHI, Haruna）

山梨大学　教育人間科学部

深沢　佑樹　（FUKASAWA, Yuki）
山梨大学大学院　医学工学総合教育部

鈴木　聖宏　（SUZUKI, Masahiro）
東邦大学　理学部

加藤　明子　（KATO, Akiko）
北里大学大学院　海洋生命科学研究科

結城　仁夫　（YUKI, Yoshio）
日本放送協会　科学環境番組部　専任ディレクター

高野　克彦　（TAKANO, Katsuhiko）
株式会社 NHK　グローバルメディアサービス　映像事業部　専任カメラマン

関口　実　（SEKIGUCHI, Minoru）
日本放送協会　報道局映像取材部　音声

課題 JS12-09 「KOOHOO III」参加者

西川　徹　（NISHIKAWA, Toru）
海洋研究開発機構　事業推進部広報課

大橋　みさき　（OHASHI, Misaki）
海洋研究開発機構　事業推進部広報課

藤岡　換太郎　（FUJIOKA, Kantaro）
神奈川大学工学部

高橋　直樹　（TAKAHASHI, Naoki）
千葉県立中央博物館　地学研究科

三森　亮介　（MIMORI, Ryosuke）
東京動物園協会　葛西臨海水族園

1-2. Operation team of the ROV *Hyper-Dolphin*

運航長	Submersible Operation Manager	大野　芳生	（ONO, Yoshinari）
一潜技師	1st Submersible Technical Officer	植木　光弘	（UEKI, Mitsuhiro）
二潜技師	2nd Submersible Technical Officer	榊原　佑太	（SAKAKIBARA, Yudai）
二潜技師	2nd Submersible Technical Officer	菊谷　茂	（KIKUYA, Shigeru）
二潜技師	2nd Submersible Technical Officer	鈴木　啓吾	（SUZUKI, Keigo）
二潜技師	2nd Submersible Technical Officer	竹ノ内　純	（TAKENOUCHI, Atsushi）
二潜技師	2nd Submersible Technical Officer	西郷　亮	（SAIGO, Ryo）

1-3. Captain and crew of the R/V Natsushima

船長	Captain	請藏　榮孝	（UKEKURA, Eiko）
一航士	Chief Officer	青木　高文	（AOKI, Takafumi）
二航士	2nd Officer	千葉　匡人	（CHIBA, Masato）
三航士	3rd Officer (Health Supervisor)	勝又　基	（KATSUMATA, Motoi）
機関長	Chief Engineer	船江　幸司	（FUNAE, Koji）
一機士	1st Engineer	田戸岡　直仁	（TADOOKA, Naohito）
二機士	2nd Engineer	白潟　健一	（SHIRAKATA, Kenichi）
三機士	3rd Engineer	橋本　浩一	（HASHIMOTO, Koichi）
電子長	Chief Electronic operator	井上　翼一	（INOUE, Yoichi）
二電士	2nd Electronic operator (Health Supervisor)	山本　洋平	（YAMAMOTO, Yohei）
甲板長	Boat swain	小田　初男	（ODA, Hatsuo）
甲板手	Quarter Master	今野　康男	（KONNO, Yasuo）
甲板手	Quarter Master	市川　伸之	（ICHIKAWA, Nobuyuki）
甲板手	Quarter Master	石井　幸人	（ISHII, Yukito）
甲板手	Quarter Master	松尾　仁智	（MATSUO, Yoshiaki）
甲板員	Sailor	伊藤　英雄	（ITO, Hideo）
甲板員	Sailor	金田　勇作	（KANADA, Yusaku）
操機長	No.1 oiler	北野　勝	（KITANO, Masaru）
操機手	Oiler	張本　恒雄	（HARIMOTO, Tsuneo）
機関員	Assistant Oiler	松井　利範	（MATSUI, Toshinori）
機関員	Assistant Oiler	巖　泰淳	（IWAO, Taijun）
機関員	Assistant Oiler	佐藤　大樹	（SATO, Daiki）
司厨長	Chief Steward	森田　富久	（MORITA, Tomihisa）
司厨手	Steward	桐田　浩二	（KIRITA, Koji）
司厨手	Steward	小路　清隆	（KOSUJI, Kiyotaka）
司厨員	Steward	中野　瑞紀	（NAKANO, Mizuki）
司厨員	Steward	川瀬　勝弘	（KAWASE, Katsuhiro）
次三機士	Jr. 3rd Engineer	上村　尚臣	（UEMURA, Naoomi）

2. Proposals

2-1. Comprehensive proposal

Yoshihiro FUJIWARA
(JAMSTEC)

The main purpose of this diving cruise is to describe an early succession of whale-fall ecosystems at a depth of 500 m in Sagami Bay. A stranded carcass of a sperm whale calf was deployed off Atami City in Sagami Bay on June 8, 2012. During this cruise, we would like to measure a consumption rate of the whale carcass and faunal diversity at this location 2.5 months after the deployment. In addition, we will retrieve several time-lapse camera system, two sediment traps and three current profilers around the carcass. This project is under collaboration with NHK and Discovery Channel for broadcasting.

Toru NISHIKAWA
(JAMSTEC)

The purpose of this dive is to describe the west wall of the unnamed submarine canyon, one of the branches of the Nojima Canyon, in the So-o Trough, which will be used for education in geology and geography of areas in and around Sagami Bay.

3. Dive survey results

3-1. Dive list

Dive # / Date	Main purposes	Site	Landing / Leaving bottom	Latitude (N)	Longitude (E)	Depth (m)
#1424	Observation of a sperm whale carcass	SAITO	8:48	35-05.530′N	139-10.268′E	488
2012/8/22			10:25	35-05.577′N	139-10.260′E	489
#1425	Observation of a sperm whale carcass	SAITO	14:10	35-05.520′N	139-10.272′E	489
2012/8/22			16:07	35-05.583′N	139-10.293′E	492
#1426	So-o Trough	branches of the Nojima canyon	9:32	34-46.673′N	139-50.289′E	1,508
2012/8/23			16:19	34-47.712′N	139-50.922′E	1,054
#1427	Observation of a sperm whale carcass	SAITO	8:24	35-05.512′N	139-10.253′E	487
2012/8/24			12:04	35-05.572′N	139-10.267′E	489
#1428	Observation of a humpback whale carcass	Humpback	14:28	35-04.447′N	139-07.669′E	402
2012/8/24			16:17	35-04.485′N	139-07.566′E	399

3-2. Preliminary results

Dive number: HD#1424

Date: August 22, 2012

Site: "Saito" site in Sagami Bay

Chief observer: Yoshihiro FUJIWARA (JAMSTEC)

Main purposes: Observation of the whale "*Saito*" and retrieval of time-lapse video camera systems and a sediment trap

Payload equipment:

1. Suction sampler & multiple canisters	1
2. Niskin bottle	2
3. Recovery hook	2
4. Rope cutter	1

Dive summary

A baby sperm whale deployed on June 8, 2012 was revisited. Most soft tissues were consumed and the bone remains were scattered. *Osedax* polychaetes were observed on the skull and ribs but not on the vertebrae. One timer cam (NHK), one time-lapse video camera (V2) and one sediment trap (No.1) were retrieved.

Sampling & marker points

(1) Recovery of time-lapse camera 35°05.577'N, 139°10.260'E, Depth: 489m

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Dive number: HD#1425

Date: August 22, 2012

Site: "Saito" site in Sagami Bay

Chief observer: Yoshihiro FUJIWARA (JAMSTEC)

Main purposes: Observation of the whale "*Saito*" and retrieval of time-lapse video camera systems and a sediment trap

Payload equipment:

1. Suction sampler & multiple canisters	1
2. Niskin bottle	2
3. Recovery hook	2
4. Rope cutter	1

Dive summary

This dive was conducted mainly for retrieval of instruments deployed in previous dives. One time-lapse video camera (V1), an ADCP and one sediment trap (No.2) were safely retrieved simultaneously. A bait trap was deployed for collecting scavengers.

Sampling & marker points

(1) Deployment of bait trap 35°05.570'N, 139°10.269'E, Depth: 489m

Dive number: HD#1426
Date: August 23, 2012
Site: So-o Trough
Chief observer: Toru NISHIKAWA (JAMSTEC)
Main purposes: Observation of Nojima Canyon in the So-o Trough
Payload equipment:

1. Suction sampler & multiple canisters	1
2. Niskin bottle	2
3. MBARI corer	3

Dive summary

The 1426 dive was performed along the west wall of the unnamed submarine canyon, one of the branches of the Nojima canyon, in the So-o Trough. Dive started at the junction of the two canyons and later proceeded along the wall of the unnamed canyon. We observed thick sediments transported by turbidity currents from land at the center of the canyon, eroded surface of the basement sedimentary rocks of the canyon wall. During the dive we collected 7 rocks (Mud stone, conglomerate), 4 push cores and 10 organisms.

About the living organisims, many periphyton were seen on some of the submarine canyon walls. Particularly, many periphyton were observed on the overhanging rock surface at the depth around 1,340m, where it seems to be likely a good place for them to capture and eat the organic matters such as the marine snow brought in a current. However, even the same point where the sediments cover the surface of the rock, there was uncommon the visible periphyton. We sampled a sea lily (Crinoidea) species which attached to a rock at the depth of 1,339m. Some more sea lilies (Crinoidea) thought to be the same species were found in the surrounded area, but none was seen at the other area.

Sampling & marker points

(1)	Multi sampling	34°46.673’N, 139°50.289’E, Depth: 1506m
(2)	Rock sampling	34°46.697’N, 139°50.290’E, Depth: 1505m
(3)	Rock & bio sampling	34°46.710’N, 139°50.311’E, Depth: 1497m
(4)	Biological sampling	34°46.978’N, 139°50.536’E, Depth: 1339m
(5)	Sediment sampling	34°47.047’N, 139°50.554’E, Depth: 1275m
(6)	Multi sampling	34°47.611’N, 139°50.646’E, Depth: 1110m
(7)	Rock sampling	34°47.679’N, 139°50.700’E, Depth: 1093m
(8)	Bio & sediment sampling	34°47.712’N, 139°50.922’E, Depth: 1054m

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Dive number: HD#1427
Date: August 24, 2012

Site: Off Atami (500 m Baby sperm whale fall deployment site)
Chief observer: Masayuki MIYAZAKI (JAMSTEC)
Main purposes: Recover steal camera (S) and a sampling of organism, sediment and water near the baby sperm whale site
Payload equipment:

5. long sample boxes	1
6. Suction sampler & single canister	1
7. MBARI corer	4
8. Niskin bottle	2
9. Recovery hook	2
10. Kumade sediment sampler	1
11. DO meter	1
12. Redox meter	1

Dive summary

The purpose of this dive was recovered steal camera (S) deployed near the "Baby Makko" at 2012/6/12 in Alucia cruise. In addition, we collected bones, organism, sediments and seawater near the "Baby Makko" site and "Vertebra of *BerardiusI"* site off Atami.

Sampling & marker points

(2)	Water sampling	35°05. 512'N, 139°10. 253'E, Depth: 487 m
(3)	Vertebrae deployed	35°05. 544'N, 139°10. 265'E, Depth: 489 m
(4)	Sediment sampling	35°05. 544N, 139°10. 265'E, Depth: 489 m
(5)	Bone sampling	35°05. 544N, 139°10. 265'E, Depth: 489 m
(6)	SAITO	35°05. 569'N, 139°10. 271'E, Depth: 490 m
(7)	SAITO bone sampling	35°05. 569'N, 139°10. 271'E, Depth: 490 m
(8)	Sediment sampling	35°05. 569'N, 139°10. 271'E, Depth: 490 m
(9)	Water sampling	35°05. 569'N, 139°10. 271'E, Depth: 490 m
(10)	Biological sampling	35°05. 572'N, 139°10. 267'E, Depth: 489 m
(11)	Sediment sampling	35°05. 572'N, 139°10. 267'E, Depth: 489 m
(12)	Sediment sampling	35°05. 572'N, 139°10. 267'E, Depth: 489 m
(13)	Biological sampling	35°05. 572'N, 139°10. 267'E, Depth: 489 m
(14)	Recovery of time-lapse camera	35°05. 572'N, 139°10. 267'E, Depth: 489 m

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Dive number: HD#1428
Date: August 24, 2012
Site: 400m whale fall site in Sagami Bay
Landing: Time: 14:28, Lat: 35°04.447'N, Long: 139°07.669'E, Depth: 402 m (WGS84)
Leaving: Time: 16:17, Lat: 35˚04.485'N, Long: 139˚07.566'E, Depth: 399m

(WGS84)

Chief observer: Masaru KAWATO (JAMSTEC)

Main purposes: Discovery and observation of new sunken whale carcasses at the depth of 400m off Atami, Sagami bay

Payload equipment:

13. Sampling box (Long type)	1
14. Suction sampler & Single canister	1
15. MBARI corer	3
16. Niskin bottle	2
17. Kumade sampler	1

Dive summary

The purpose of this dive was to find the two sunken whale carcasses, which were deployed by Atami city on December 7 in 2012 and March 28 in 2013. One of these carcasses, a humpback whale carcass was discovered at the depth of 400m off Atami. This was the first observation of this shallower whale. Many *Osedax* polychates could be observed on the bones. Sediment and water sampling using MBARI corers and Niskin bottles were conducted near the whale. After that two finger bones with *Osedax* were collected by the suction sampler.

Sampling & marker points

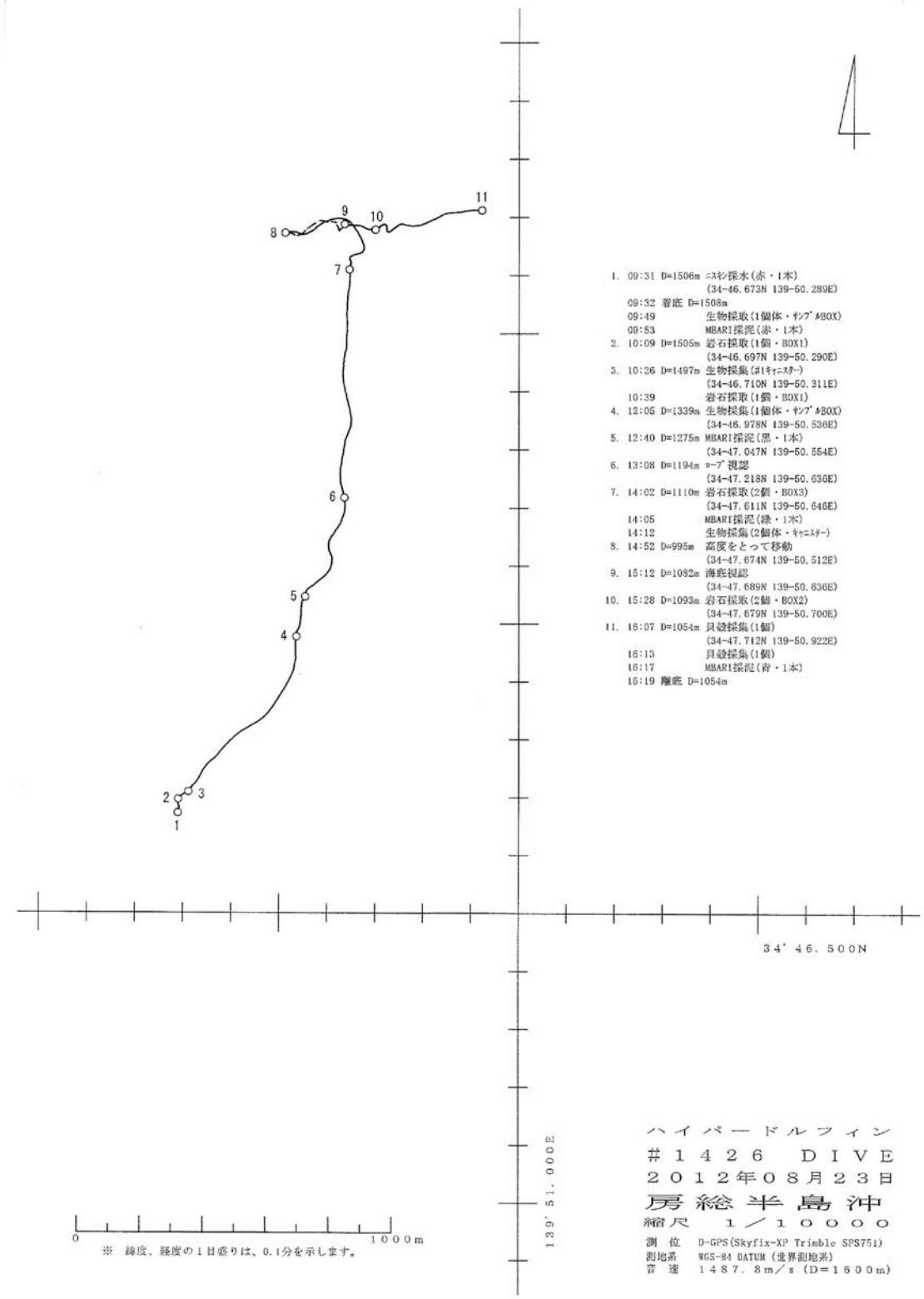
(15) Humpback whale	35°04.485'N, 139°07.566'E, Depth: 399 m
(16) Water sampling	35°04.485'N, 139°07.566'E, Depth: 399 m
(17) Sediment sampling	35°04.485'N, 139°07.566'E, Depth: 399 m
(18) Bone sampling	35°04.485'N, 139°07.566'E, Depth: 399 m

3-3. Dive tracks
HD#1424

HD#1425

1. 14:10 D=486m 着底
(35-05.520N 139-10.272E)
14:11 D=480m ニスキン採水(赤・1本)
14:17 D=489m MBARI採泥(赤・1本)
2. 14:32 D=489m ADCP設置
(35-05.570N 139-10.269E)
14:36 H-14257ﾄﾗﾝｽﾎﾟﾝﾀｰ設置
14:39 ADCP回収
14:43 D=485m ニスキン採水(緑・1本)
3. 14:58 D=488m MBARI採泥(緑・1本)
(35-05.576N 139-10.260E)
15:41 ﾀｲｶﾞｰｽﾈｲﾙ(V1)回収作業開始
4. 15:47 D=492m No.2ﾋﾟｯﾄﾗｯﾌﾟ(ROV HOMER ID:44)回収作業開始
(35-05.583N 139-10.293E)
16:02 ﾀｲｶﾞｰｽﾈｲﾙ(V1)回収作業終了
16:06 No.2ﾋﾟｯﾄﾗｯﾌﾟ(ROV HOMER ID:44)回収作業終了
16:07 着底 D=492m
1
2
3
4
35° 05.500N
139° 10.300E
0
200m
※ 緯度、経度の1目盛りは、0.1分を示します。
ハイパードルフィン
#1425 DIVE
2012年08月22日
相模湾 熱海沖
縮尺 1／2000
測 位 D-GPS(Skyfix-XP Trimble SPS751)
測地系 WGS-84 DATUM (世界測地系)
音 速 1498.4m／s (D=500m)

HD#1426

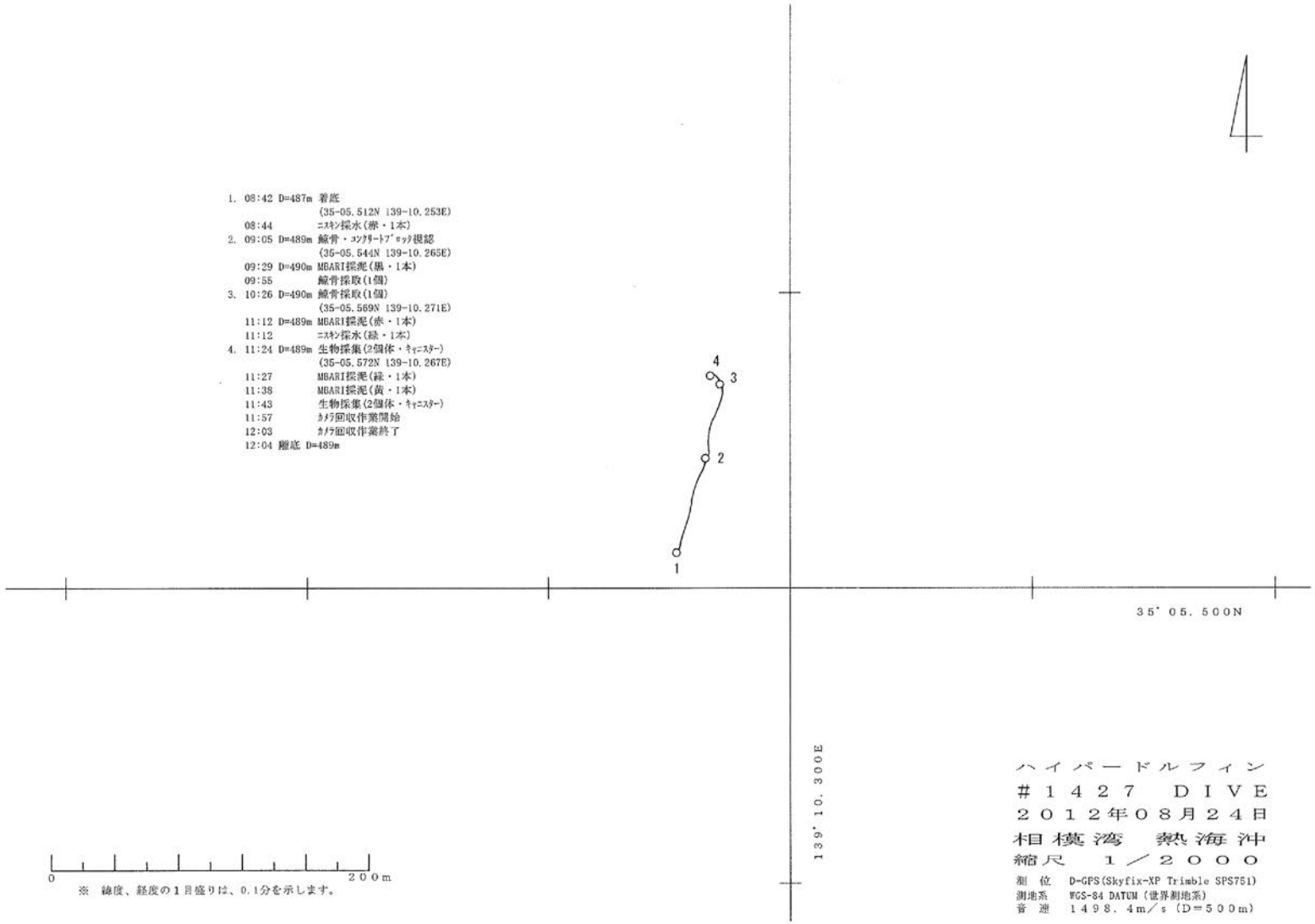


1. 09:31 D=1506m ﾆｽｷﾝ採水(赤・1本)
(34-46.673N 139-50.289E)
09:32 着底 D=1508m
09:49 生物採取(1個体・ｻﾝﾌﾟﾙBOX)
09:53 MBARI採泥(赤・1本)
2. 10:09 D=1505m 岩石採取(1個・BOX1)
(34-46.697N 139-50.290E)
3. 10:26 D=1497m 生物採集(#1ｷｬﾆｽﾀｰ)
(34-46.710N 139-50.311E)
10:39 岩石採取(1個・BOX1)
4. 12:05 D=1339m 生物採集(1個体・ｻﾝﾌﾟﾙBOX)
(34-46.978N 139-50.536E)
5. 12:40 D=1275m MBARI採泥(黒・1本)
(34-47.047N 139-50.554E)
6. 13:08 D=1194m ﾛｰﾌﾟ視認
(34-47.218N 139-50.636E)
7. 14:02 D=1110m 岩石採取(2個・BOX3)
(34-47.611N 139-50.646E)
14:05 MBARI採泥(緑・1本)
14:12 生物採集(2個体・ｷｬﾆｽﾀｰ)
8. 14:52 D=995m 高度をとって移動
(34-47.674N 139-50.512E)
9. 15:12 D=1082m 海底視認
(34-47.689N 139-50.636E)
10. 15:28 D=1093m 岩石採取(2個・BOX2)
(34-47.679N 139-50.700E)
11. 16:07 D=1054m 貝殻採集(1個)
(34-47.712N 139-50.922E)
16:13 貝殻採集(1個)
16:17 MBARI採泥(青・1本)
16:19 離底 D=1054m

ハイパードルフィン
#1426 DIVE
2012年08月23日
房総半島沖
縮尺 1／10000
測 位 D-GPS(Skyfix-XP Trimble SPS751)
測地系 WGS-84 DATUM (世界測地系)
音 速 1487.8m／s (D=1600m)

HD#1427

1. 08:42 D=487m 着底
(35-05.512N 139-10.253E)
08:44 ﾆｽｷﾝ採水(赤・1本)
2. 09:05 D=489m 鯨骨・ｺﾝｸﾘｰﾄﾌﾞﾛｯｸ視認
(35-05.544N 139-10.265E)
09:29 D=490m MBARI採泥(黒・1本)
09:55 鯨骨採取(1個)
3. 10:26 D=490m 鯨骨採取(1個)
(35-05.569N 139-10.271E)
11:12 D=489m MBARI採泥(赤・1本)
11:12 ﾆｽｷﾝ採水(緑・1本)
4. 11:24 D=489m 生物採集(2個体・ｷｬﾆｽﾀｰ)
(35-05.572N 139-10.267E)
11:27 MBARI採泥(緑・1本)
11:38 MBARI採泥(黄・1本)
11:43 生物採集(2個体・ｷｬﾆｽﾀｰ)
11:57 ｶﾒﾗ回収作業開始
12:03 ｶﾒﾗ回収作業終了
12:04 離底 D=489m



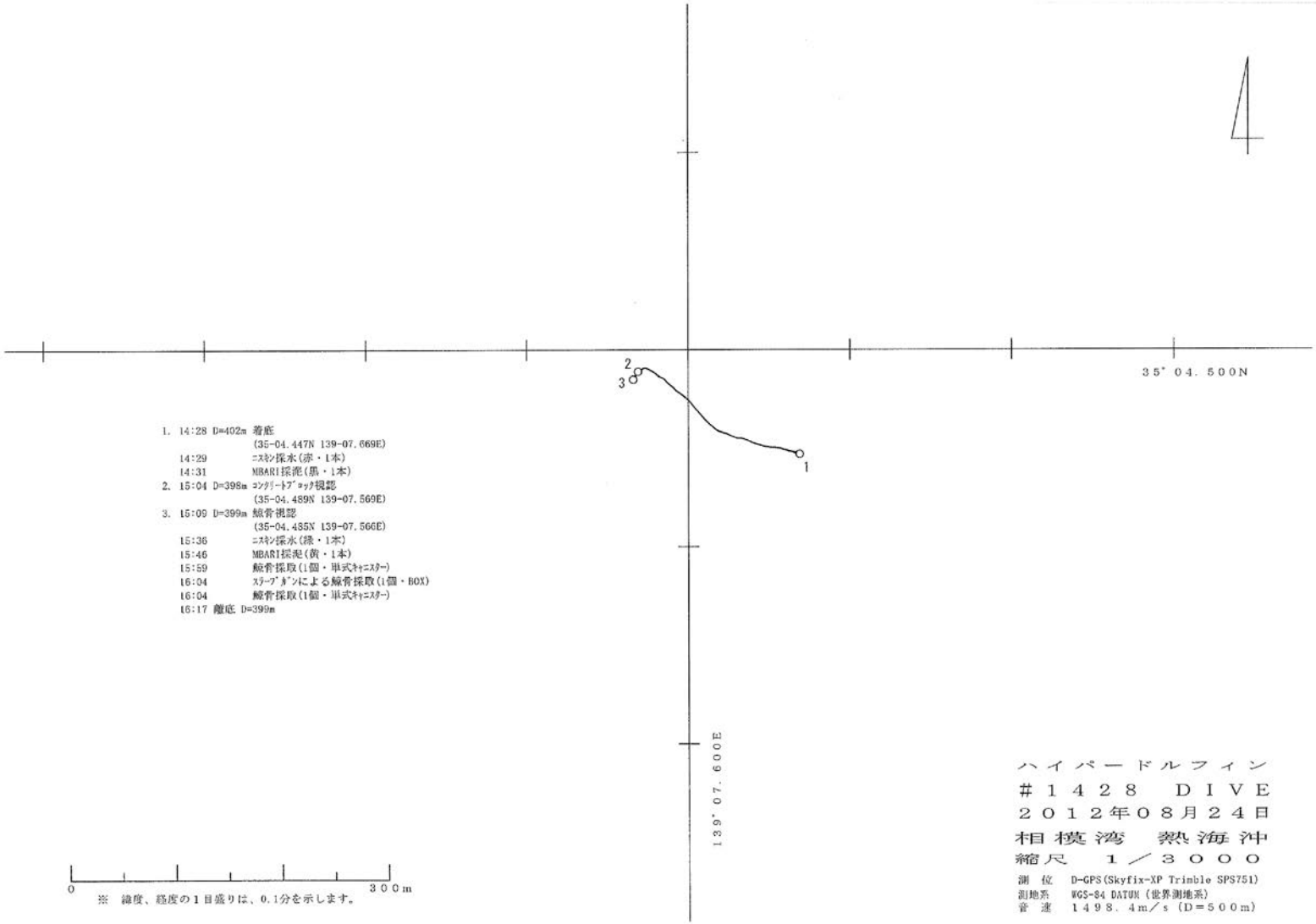
0 200m

※ 緯度、経度の1目盛りは、0.1分を示します。

ハイパードルフィン
＃１４２７ ＤＩＶＥ
２０１２年０８月２４日
相模湾 熱海沖
縮尺 １／２０００

測 位 D-GPS(Skyfix-XP Trimble SPS751)
測地系 WGS-84 DATUM (世界測地系)
音 速 1498.4m/s (D=500m)

HD#1428



1. 14:28 D=402m 着底
(35-04.447N 139-07.669E)
14:29 ニスキン採水(赤・1本)
14:31 MBARI採泥(黒・1本)
2. 15:04 D=398m コンクリートブロック視認
(35-04.489N 139-07.569E)
3. 15:09 D=399m 鯨骨視認
(35-04.485N 139-07.566E)
15:36 ニスキン採水(緑・1本)
15:46 MBARI採泥(黄・1本)
15:59 鯨骨採取(1個・単式キャニスター)
16:04 スラープガンによる鯨骨採取(1個・BOX)
16:04 鯨骨採取(1個・単式キャニスター)
16:17 離底 D=399m

0 300m

※ 緯度、経度の1目盛りは、0.1分を示します。

ハイパードルフィン
＃１４２８ ＤＩＶＥ
２０１２年０８月２４日
相模湾 熱海沖
縮尺 １／３０００

測 位 D-GPS(Skyfix-XP Trimble SPS751)
測地系 WGS-84 DATUM (世界測地系)
音 速 1498.4m／s (D＝500m)

4. Time-lapse filming of a whale

Retrieving NHK's Timer-Cam video camera system

NHK had deployed a timelapse video system "Timer-Cam" at the whale carcass site in Sagami bay off Atami Port on June 23rd. It had stayed there for 60 days, and it was retrieved by #1428 on August 22nd.

'Timer-Cam'is a deep water pressure proof timelapse video camera system. Camera and lighting system of Timer-Cam are identical with JAMSTEC's timelapse video camera system developed by Goto Aquatics Inc. NHK's Deep Sea Project team has utilized Timer-Cam in Suruga Bay for almost 3 years, and found the system most reliable and easy to use. Timer-Cam has filmed many precious footages in the various circumstances. NHK team regards it as the most useful camera among the deep sea cameras they have utilized.

Timer-Cam weighs about 20 kg for the camera system, and weighs 40kg with stainless frame to be deployed on the sea bottom. Camera system of Timer-Cam consists of Sony Handycam HC-3 with fisheye wide conversion lenz. Owing to this fisheye lenz and doom port, Timer-Cam is capable of commanding very wide view. Video is recorded on HDV mini cassette which enables to record full-HD footages up to 85 min. depending on the tape length.

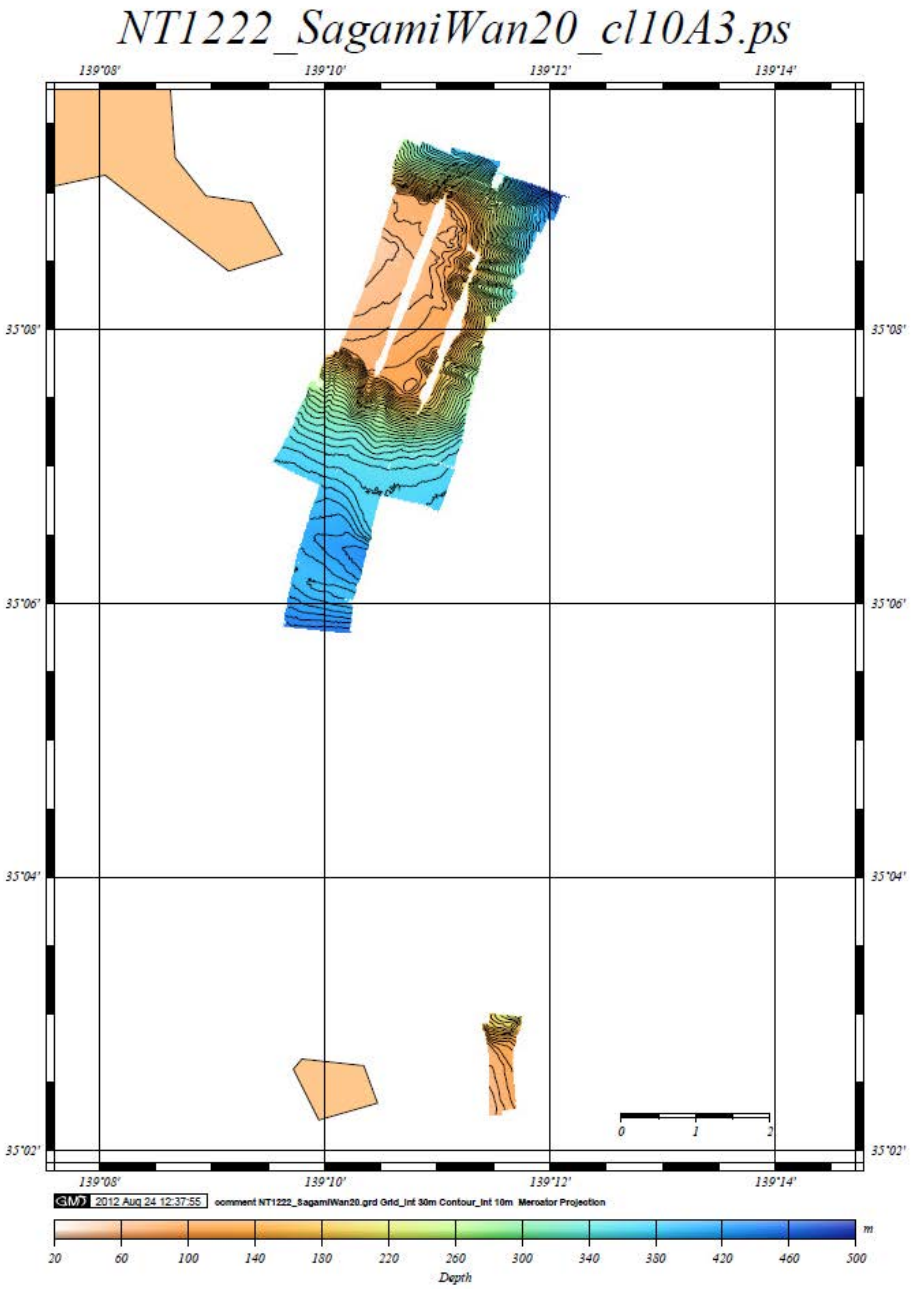
Timer-Cam is equipped with two white LED light sets, left and right, and the battery for the lights are contained in the housing. Timer for shooting the video can be set with 4 index, pre-record stand-by duration(STB), each recording duration (REC), each recording interval (INT), and times to repeat the recording and interval.(setting timer)
When filming mid-water, the system is hung with rope or fishing line, and for filming benthic circumstances, the stainless frame is applied to adjust the shooting hight.

Deployment
At dive #1395, NHK team deployed Timer-Cam system which was fixed on the stainless frame. Its timer had been set as: STB-390min., REC-002min., INT-58min., TIME(repetition times)-50times. The timer was started at 13:57 on June 23rd. With this settings, NHK tried to film the whale carcass from 20:27 on June 23rd. to June 25th. by 2 min. every 60 min. It aimed to film the footage of big sharks munching on the whale carcass.

Timer-Cam was retrieved at dive #1424 on August 22nd. after it had been on the floor

for 60 days. When Hyper-Dolphin was recovered, several bruises of camera housing, as well as the stainless frame, were found, which seemed to have slightly been eroded and damaged by the electric discharge in the sea water. Nevertheless, the camera housing remained its water proof and tape in the camera was retrieved safe. Reviewing the tape showed that the filming was successful and the tape was consumed till the end of it, as it had been designed, but it contained footage of only pug nose eels, giant isopods, and deep sea cods. Big sharks never appeared in this footage.

5. Geophysical survey result



6. Scientific results

6-1. Comprehensive results

<IMPACTO III>

To elucidate faunal succession and decomposition process of a whale carcass, an ROV diving research was conducted in Sagami Bay. A baby sperm whale (5 m in total length) was submerged at a depth of 500 m in the bay on June 8, 2012. Most soft tissues were consumed within 2.5 months from the deployment. Most dominant consumers were eels and crustaceans from the ROV observations. For long-term observations and analyses, four time-lapse cameras, two sediment traps and three current profilers were retrieved around the carcass. Additionally, a sunken humpback whale carcass, which was deployed by a local government, was observed.

<KOOHOO III>

This dive was performed along the west wall of the unnamed submarine canyon, one of the branches of the Nojima canyon, in the So-o Trough. Dive started at the junction of the two canyons and later proceeded along the wall of the unnamed canyon. We observed thick sediments transported by turbidity currents from land at the center of the canyon, eroded surface of the basement sedimentary rocks of the canyon wall. During the dive we collected 7 rocks (Mud stone, conglomerate), 4 push cores and 10 organisms.

6-2. Respective results

Kenji OKOSHI, Masahiro SUZUKI
(Toho University)

Development, growth and survival in the whale bone attached mussels
(1) Larval studies of mussels, (2) shell morphology and microstructure

The object of this study is to find swimming larva, juvenile and adult mussels which attached to whale bone in order to obtain effective information on development, growth, behavior and hard tissue formation.

We collected a dead shell of bivalve (Fig.1) from the sample box of the HPD#1427. The bivalve was identified *Idasola* sp. from the morphological characteristics including the shape of prodisconch.

To find the microstructure of the dead shell of mussel collected from the sample box, formalin fixed sample will be observed by SEM.

Fig.1 A dead shell of mussel collected from the sample box

Notice on using

This cruise report is a preliminary documentation as of the end of the cruise.This report may not be corrected even if changes on contents (i.e. taxonomic classifications) may be found after its publication. This report may also be changed without notice. Data on this cruise report may be raw or unprocessed. If you are going to use or refer to the data written on this report, please ask the Chief Scientist for latest information. Users of data or results on this cruise report are requested to submit their results to the Data Management Group of JAMSTEC.

Appendix

I. Sample list

I-1. Macro organisms

On board ID	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1424-1	Ophiuroidea	many	70% EtOH	70% ETOH	Off Atami	35	05.577	N	139	10.260	E	489	2012	8	22	セジメントトラップ No.1 のフレームに付着
1425-1	Holothurian	many			Off Atami	35	05.583	N	139	10.293	E	492	2012	8	22	セジメントトラップ No.2 のフレームに付着
1427-1	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-2	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-3	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-4	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-5	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-6	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-7	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-8	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-9	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-10	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-11	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-12	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-13	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
																トランク，パルプの 1 部
1427-14	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-15	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-16	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-17	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubi or O.rose トランク，パルプの 1 部
1427-18	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-19	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-20	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-21	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-22	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-23	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-24	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-25	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-26	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-27	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-28	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
																トランク，パルプの 1 部
1427-29	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-30	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-31	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-32	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 Red palp type トランク，パルプの 1 部
1427-33	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-34	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部
1427-35	*Osedax* sp.	1	Frozen	Frozen	Saito	35	05.569	N	139	10.271	E	490	2012	8	24	マッコウ肋骨より採集 O.roseus type トランク，パルプの 1 部

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-36	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-37	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-38	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-39	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-40	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-40r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 個体 40 のルートの 1 部
1427-41	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-42	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-43	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-44	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 O.rubiplumus type トランク，パルプの 1 部
1427-45	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-46	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-47	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-48	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-49	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 トランク，パルプの 1 部
1427-50 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 2 palp type Whole body
1427-50 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 2 palp type Root の 1 部
1427-51 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 Whole body
1427-51 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 Root の 1 部
1427-52	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 Small type Trunk, palp

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-53 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 Whole body photo1~5
1427-53 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-53 の root の一部 一部を培養用に使用
1427-54 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type phto6~11
1427-54 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-54 の root の一部
1427-55	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type photo12
1427-56	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type whole body
1427-57	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-58	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type photo18~19
1427-58 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-58 の一部
1427-59	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type
1427-60	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type whole body photo20
1427-60r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-14 のルートの一部
1427-61	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type photo21
1427-61r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-61 のルートの一部

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-62	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type photo22
1427-62 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-62 のルートの一部
1427-63	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 黄緑 photo24
1427-63 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-63 のルートの一部
1427-64	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 green root type photo18~19
1427-65	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 黄緑 whole body
1427-66	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 黄緑 whole body

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-67	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 黄緑 whole body
1427-68	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 黄緑 whole body
1427-69	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 黄緑 whole body
1427-70	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole
1427-71	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole
1427-72	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole
1427-73	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-74	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole
1427-75	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole
1427-76	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 whole
1427-77	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 body
1427-78	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 body
1427-79	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 body
1427-80	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 緑 body

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-81 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 yellow photo25
1427-81 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 1427-81 のルートの一部
1427-82 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 yellow photo26
1427-82 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 yellow 1427-82 のルートの一部
1427-83 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-83 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-84	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-85	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-86	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-87	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-88	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-89	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-90	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-91	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-92	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-93	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-94	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-95	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-96	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-97	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-98	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-99	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-100	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 2 palp type? photo1~9
1427-101 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 photo10
1427-101 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-102 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 photo11

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-102 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-103 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 photo12
1427-103 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-104	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-105	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-106	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-107	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-108	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-109	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-110	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-111	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1427-112	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-113	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-114	*Osedax* sp. Mucus	1	70% Ethanol	70% Ethanol	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-121 For	*Osedax* sp.	1	10% Formalin	10% Formalin	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集 photo1~4
1427-121 r	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-150	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1427-151	*Osedax* sp.	1	Frozen	Frozen	VERTEBRA	35	05.544	N	139	10.265	E	490	2012	8	24	ツチ脊椎骨より採集
1428-1	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-2	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-3	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-4	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-5	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1428-6	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-7	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-8	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-9	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-10	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-11	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-12	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-13	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-14	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-15	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-16	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-17	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-18	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1428-19	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-20	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-21	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-22	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-23	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-24	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-25	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-26	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-27	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-28	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-29	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-30	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1428-40 For	*Osedax* sp.	1	10% Formalin	10% Formalin	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 2 palp type p120904-Zatou_001-015
1428-40 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 root の一部
1428-41 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 2 palp type?
1428-42	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-43	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-44 For	*Osedax* sp.	1	10% Formalin	10% Formalin	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 p120905-Zatou_012_018
1428-44 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 root の一部
1428-45	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-46 For	*Osedax* sp.	1	10% Formalin	10% Formalin	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 2 palp type? P120905-Zatou_019-032
1428-46 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 root の一部

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1428-47 For	*Osedax* sp.	1	10% Formalin	10% Formalin	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-46 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 root の一部
1428-48	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-49	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-50	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-51	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-52	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-53	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-101 For	*Osedax* sp.	1	10% Formalin	10% Formalin	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集
1428-101 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 root の一部
1428-102 For	*Osedax* sp.	1	10% Formalin	10% Formalin	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 Long trunk type p120913-Zatou_001_006

On board	Sample Name	No.	Fixation	Preservation	Locality	Latitude			Longitude			Depth	Date Collected			Remarks
1428-102 r	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 root の一部
1428-103	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 2 palp type trunk と palp のみ
1428-104	*Osedax* sp.	1	Frozen	Frozen	HUMPBACK	35	04.485	N	139	07.566	E	399	2012	8	24	ザトウ鯨指骨より採集 2 palp type trunk と palp のみ p120913_007_028

I-2. Sediments

Sample ID Dive#	Date Time	Site Depth (m)	Latitude (N) Longitude (E)	Core# color id	length or volume Sample processing	description Investigator	purpose additional description	storage Present Location
MG1425-1	8/22	off Atami	35-05.570	MBARI	15 cm (0-5 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:17	489	139-10.269	Green	Sliced (0-5 cm)	Miyazaki, Ohnishi	Control (20 m from the baby Makko)	Miyazaki, Tsubouchi, Ohnishi
MG1425-2	8/22	off Atami	35-05.570	MBARI	15 cm (5-10 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:17	489	139-10.269	Green	Sliced (5-10 cm)	Miyazaki, Ohnishi	Control (20 m from the baby Makko)	Miyazaki, Tsubouchi, Ohnishi
MG1425-3	8/22	off Atami	35-05.570	MBARI	15 cm (10-15 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:17	489	139-10.269	Green	Sliced (10-15 cm)	Miyazaki, Ohnishi	Control (20 m from the baby Makko)	Miyazaki, Tsubouchi, Ohnishi
MR1425-1	8/22	off Atami	35-05.575	MBARI	21 cm (0-5 cm)	Sand of ash-black color,decay odor	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:58	488	139-10.260	Red	Sliced (0-5 cm)	Miyazaki, Ohnishi	Closely to the head of Baby Makko	Miyazaki, Tsubouchi, Ohnishi
MR1425-2	8/22	off Atami	35-05.575	MBARI	21 cm (5-10 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:58	488	139-10.260	Red	Sliced (5-10 cm)	Miyazaki, Ohnishi	Closely to the head of Baby Makko	Miyazaki, Tsubouchi, Ohnishi
MR1425-3	8/22	off Atami	35-05.575	MBARI	21 cm (10-15 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:58	488	139-10.260	Red	Sliced (10-15 cm)	Miyazaki, Ohnishi	Closely to the head of Baby Makko	Miyazaki, Tsubouchi, Ohnishi
MR1425-4	8/22	off Atami	35-05.575	MBARI	21 cm (15-21 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1424	14:58	488	139-10.260	Red	Sliced (15-21 cm)	Miyazaki, Ohnishi	Closely to the head of Baby Makko	Miyazaki, Tsubouchi, Ohnishi
MB1427-1	8/24	off Atami	35-05.569	MBARI	25 cm (0-5 cm)	Sand of ash-black color, lightly-H2S odor	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	9:29	490	139-10.271	Black	Sliced (0-5 cm)	Miyazaki, Ohnishi	Closely to the vertebra site	Miyazaki, Tsubouchi, Ohnishi
MB1427-2	8/24	off Atami	35-05.569	MBARI	25 cm (5-10 cm)	Sand of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	9:29	490	139-10.271	Black	Sliced (5-10 cm)	Miyazaki, Ohnishi	Closely to the vertebra site	Miyazaki, Tsubouchi, Ohnishi
MB1427-3	8/24	off Atami	35-05.569	MBARI	25 cm (10-15 cm)	Sand of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	9:29	490	139-10.271	Black	Sliced (10-15 cm)	Miyazaki, Ohnishi	Closely to the vertebra site	Miyazaki, Tsubouchi, Ohnishi
MB1427-4	8/24	off Atami	35-05.569	MBARI	25 cm (15-20 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	9:29	490	139-10.271	Black	Sliced (15-20 cm)	Miyazaki, Ohnishi	Closely to the vertebra site	Miyazaki, Tsubouchi, Ohnishi

Sample ID Dive#	Date Time	Site Depth (m)	Latitude (N) Longitude (E)	Core# color id	length or volume Sample processing	description Investigator	purpose additional description	storage Present Location
MB1427-5	8/24	off Atami	35-05.569	MBARI	25 cm (20-25 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept a -80ºC
1427	9:29	490	139-10.271	Black	Sliced (20-25 cm)	Miyazaki, Ohnishi	Closely to the vertebra site	Ohnishi
MG1427-1	8/24	off Atami	35-05.572	MBARI	25 cm (0-5 cm)	Sand of black color, H2S odor	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	11:27	489	139-10.267	Green	Sliced (0-5 cm)	Miyazaki, Ohnishi	Bacterial mut of Baby Makko site	Miyazaki, Tsubouchi, Ohnishi
MG1427-2	8/24	off Atami	35-05.572	MBARI	25 cm (5-10 cm)	Sand of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	11:27	489	139-10.267	Green	Sliced (5-10 cm)	Miyazaki, Ohnishi	Bacterial mut of Baby Makko site	Miyazaki, Tsubouchi, Ohnishi
MG1427-3	8/24	off Atami	35-05.572	MBARI	25 cm (10-15 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	11:27	489	139-10.267	Green	Sliced (10-15 cm)	Miyazaki, Ohnishi	Bacterial mut of Baby Makko site	Miyazaki, Tsubouchi, Ohnishi
MG1427-4	8/24	off Atami	35-05.572	MBARI	25 cm (15-20 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1427	11:27	489	139-10.267	Green	Sliced (15-20 cm)	Miyazaki, Ohnishi	Bacterial mut of Baby Makko site	Miyazaki, Tsubouchi, Ohnishi
MG1427-5	8/24	off Atami	35-05.572	MBARI	25 cm (20-25 cm)	Sand and mud of ash color, ordorless	Microbial study and Chemical study	Kept a -80ºC
1427	11:27	489	139-10.267	Green	Sliced (20-25 cm)	Miyazaki, Ohnishi	Bacterial mut of Baby Makko site	Ohnishi
MY1427-1	8/24	off Atami	35-05.572	MBARI	24 cm (0-5 cm)	Sand of black color, H2S odor	Biological study	Kept at 4ºC
1427	11:38	489	139-10.267	Yellow	Sliced (0-5 cm)	Miyazaki, Nagahori	Bacterial mut of Baby Makko site	Suzuki
MY1427-2	8/24	off Atami	35-05.572	MBARI	24 cm (5-10 cm)	Sand of ash color, ordorless	Biological study	Kept at 4ºC
1427	11:38	489	139-10.267	Yellow	Sliced (5-10 cm)	Miyazaki, Nagahori	Bacterial mut of Baby Makko site	Suzuki
MY1427-3	8/24	off Atami	35-05.572	MBARI	24 cm (10-15 cm)	Sand and mud of ash color, ordorless	Biological study	Kept at 4ºC
1427	11:38	489	139-10.267	Yellow	Sliced (10-15 cm)	Miyazaki, Nagahori	Bacterial mut of Baby Makko site	Suzuki
MY1427-4	8/24	off Atami	35-05.572	MBARI	24 cm (15-20 cm)	Sand and mud of ash color, ordorless	Biological study	Kept at 4ºC
1427	11:38	489	139-10.267	Yellow	Sliced (15-20 cm)	Miyazaki, Nagahori	Bacterial mut of Baby Makko site	Suzuki
MY1427-5	8/24	off Atami	35-05.572	MBARI	24 cm (20-24 cm)	Sand and mud of ash color, ordorless	Biological study	Kept at 4ºC
1427	11:38	489	139-10.267	Yellow	Sliced (20-24 cm)	Miyazaki, Nagahori	Bacterial mut of Baby Makko site	Suzuki
MB1428-1	8/24	off Atami	35-04.447	MBARI	20 cm (0-5 cm)	Clay of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2

Sample ID Dive#	Date Time	Site Depth (m)	Latitude (N) Longitude (E)	Core# color id	length or volume Sample processing	description Investigator	purpose additional description	storage Present Location
1428	14:31	402	139-07.669	Black	Sliced (0-5 cm)	Miyazaki, Ohnishi	Control (20 m from the humpback whale)	Miyazaki, Tsubouchi, Ohnishi
MB1428-2	8/24	off Atami	35-04.447	MBARI	20 cm (5-10 cm)	Clay of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	14:31	402	139-07.669	Black	Sliced (5-10 cm)	Miyazaki, Ohnishi	Control (20 m from the humpback whale)	Miyazaki, Tsubouchi, Ohnishi
MB1428-3	8/24	off Atami	35-04.447	MBARI	20 cm (10-15 cm)	Clay of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	14:31	402	139-07.669	Black	Sliced (10-15 cm)	Miyazaki, Ohnishi	Control (20 m from the humpback whale)	Miyazaki, Tsubouchi, Ohnishi
MB1428-4	8/24	off Atami	35-04.447	MBARI	20 cm (15-20 cm)	Mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	14:31	402	139-07.669	Black	Sliced (15-20 cm)	Miyazaki, Ohnishi	Control (20 m from the humpback whale)	Miyazaki, Tsubouchi, Ohnishi
MY1428-1	8/24	off Atami	35-04.485	MBARI	25 cm (0-5 cm)	Clay of black color, decay odor	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	15:46	399	139-07.566	Yellow	Sliced (0-5 cm)	Miyazaki, Ohnishi	Closely to the hand of humpback whale	Miyazaki, Tsubouchi, Ohnishi
MY1428-2	8/24	off Atami	35-04.485	MBARI	25 cm (5-10 cm)	Clay of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	15:46	399	139-07.566	Yellow	Sliced (5-10 cm)	Miyazaki, Ohnishi	Closely to the hand of humpback whale	Miyazaki, Tsubouchi, Ohnishi
MY1428-3	8/24	off Atami	35-04.485	MBARI	25 cm (10-15 cm)	Clay of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	15:46	399	139-07.566	Yellow	Sliced (10-15 cm)	Miyazaki, Ohnishi	Closely to the hand of humpback whale	Miyazaki, Tsubouchi, Ohnishi
MY1428-4	8/24	off Atami	35-04.485	MBARI	25 cm (15-20 cm)	Clay of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	15:46	399	139-07.566	Yellow	Sliced (15-20 cm)	Miyazaki, Ohnishi	Closely to the hand of humpback whale	Miyazaki, Tsubouchi, Ohnishi
MY1428-5	8/24	off Atami	35-04.485	MBARI	25 cm (20-25 cm)	Mud of ash color, ordorless	Microbial study and Chemical study	Kept at 4ºC, -80ºC and LN2
1428	15:46	399	139-07.566	Yellow	Sliced (20-25 cm)	Miyazaki, Ohnishi	Closely to the hand of humpback whale	Miyazaki, Tsubouchi, Ohnishi

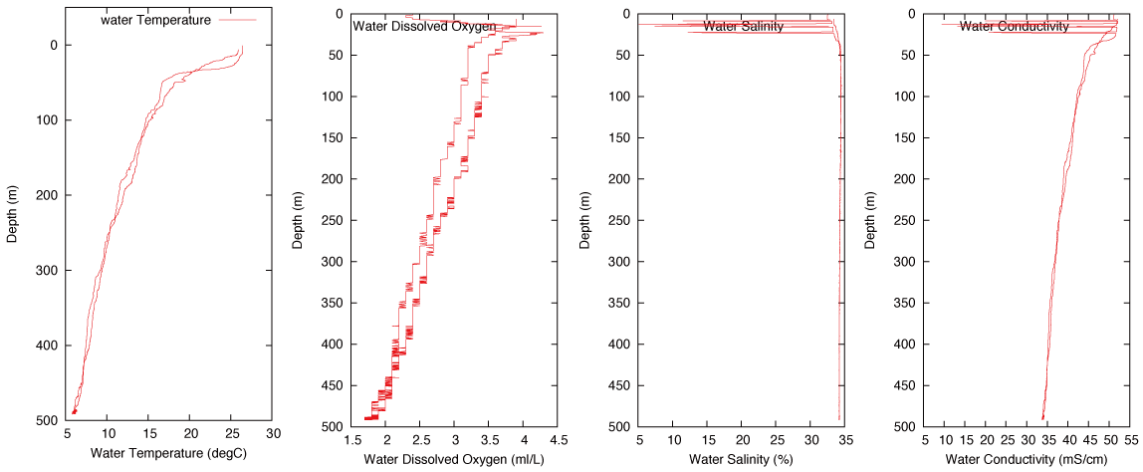
*All samples photographed

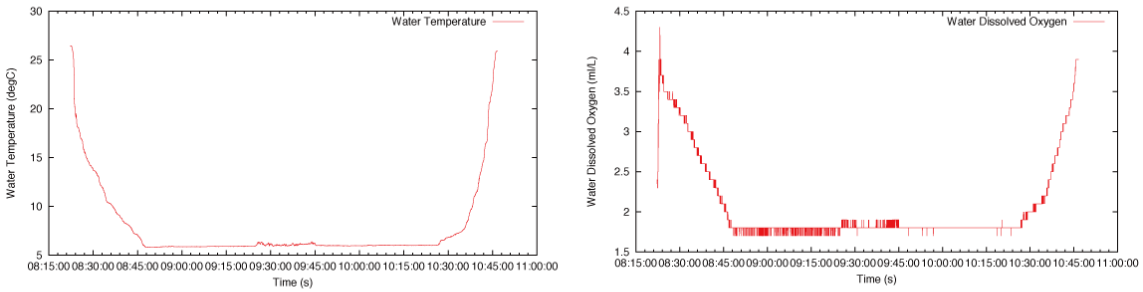
II. CTD, DO, Redox data

Fig. III-1 HPD CTD-DO Data

NT12-22, HPD #1424, 2012/08/22

Baby Makko site off Atami





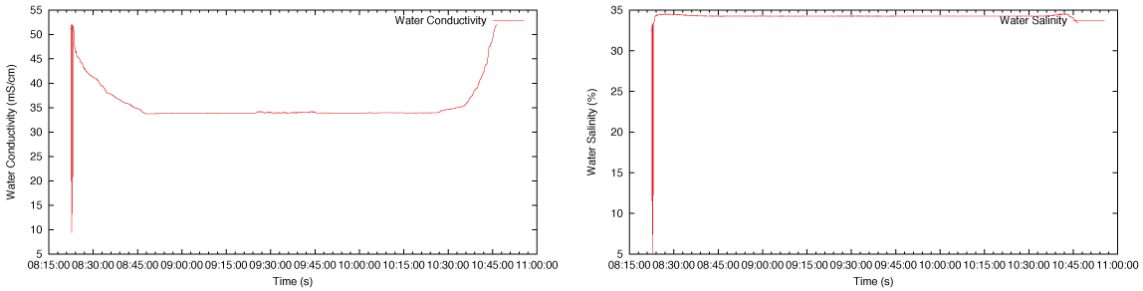
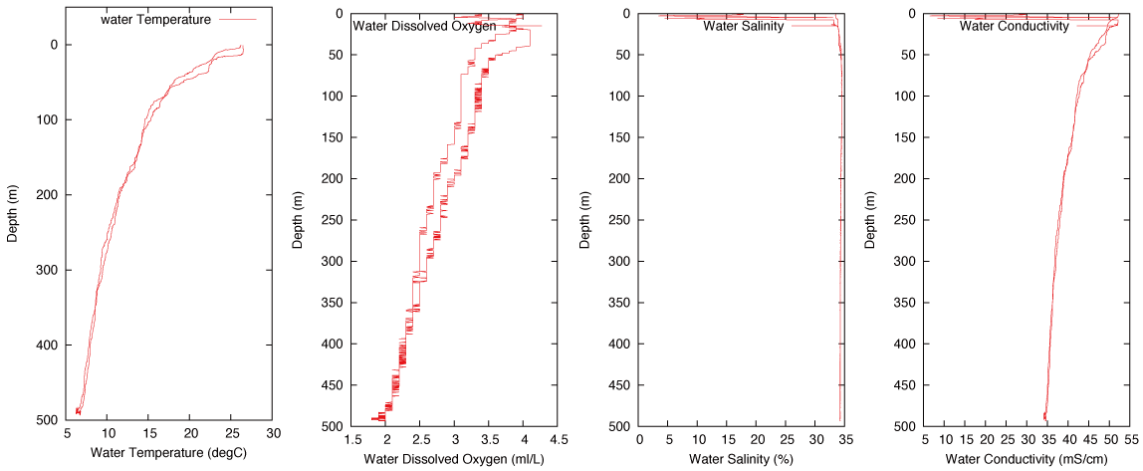
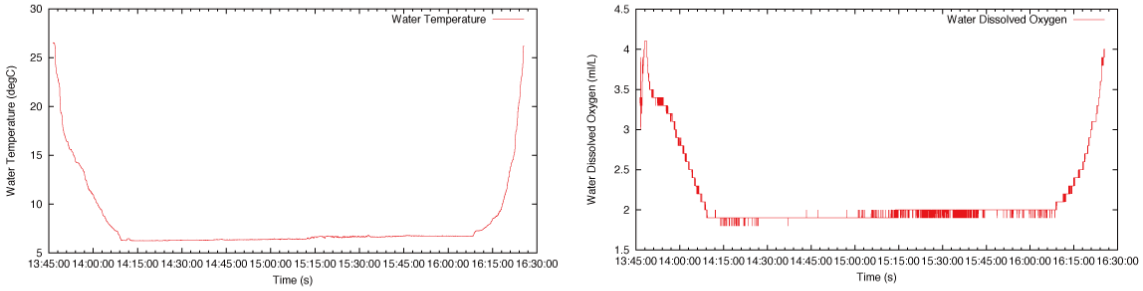


Fig. III-2 HPD CTD-DO Data

NT12-22, HPD #1425, 2012/08/22

Baby Makko site off Atami





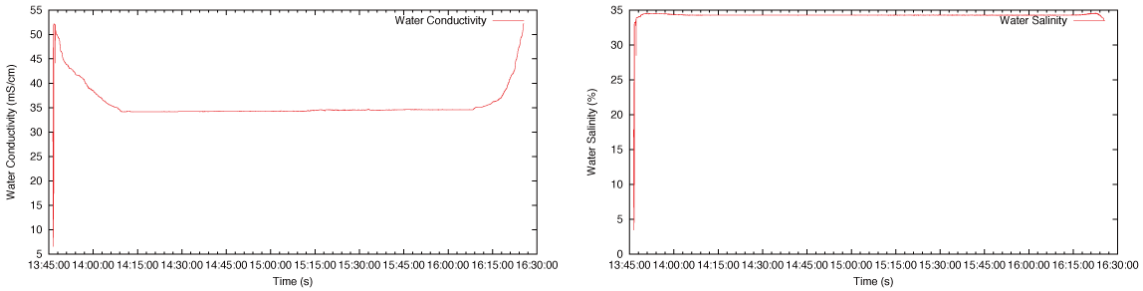
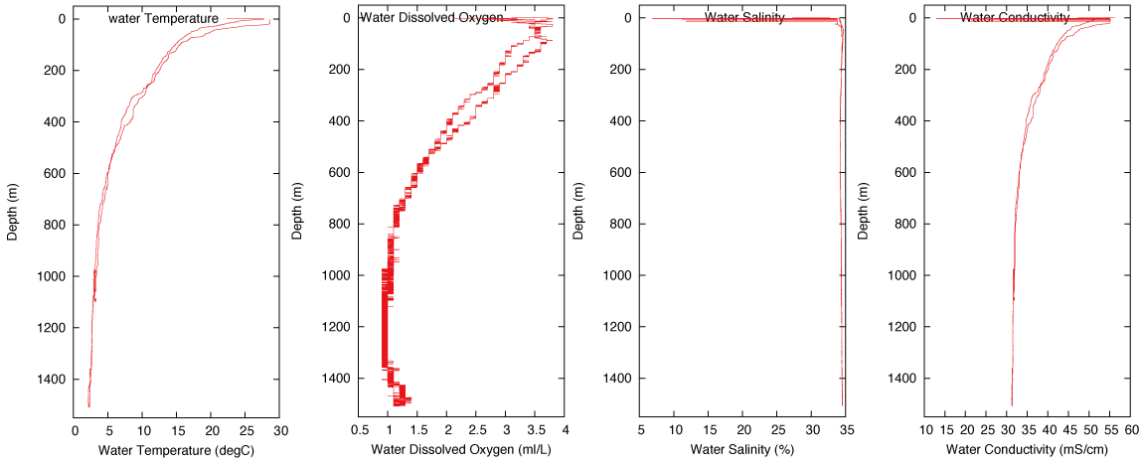
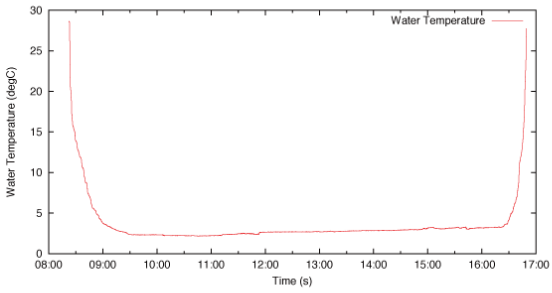


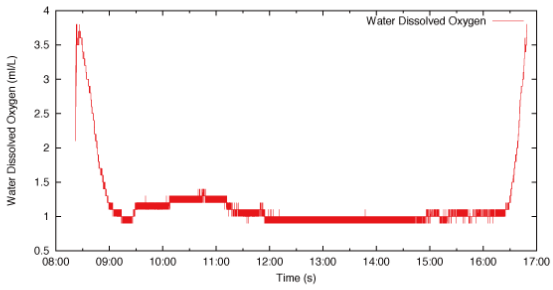
Fig. III-3 HPD CTD-DO Data

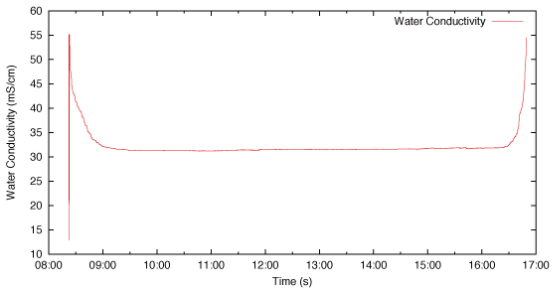
NT12-22, HPD #1426, 2012/08/23

off Bouso Peninsuar









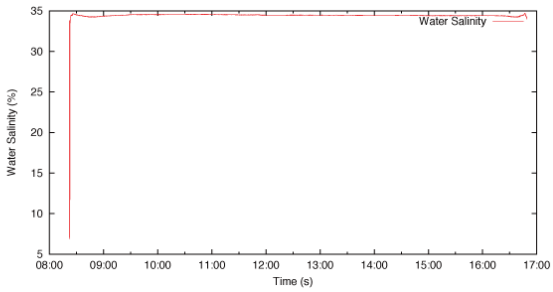
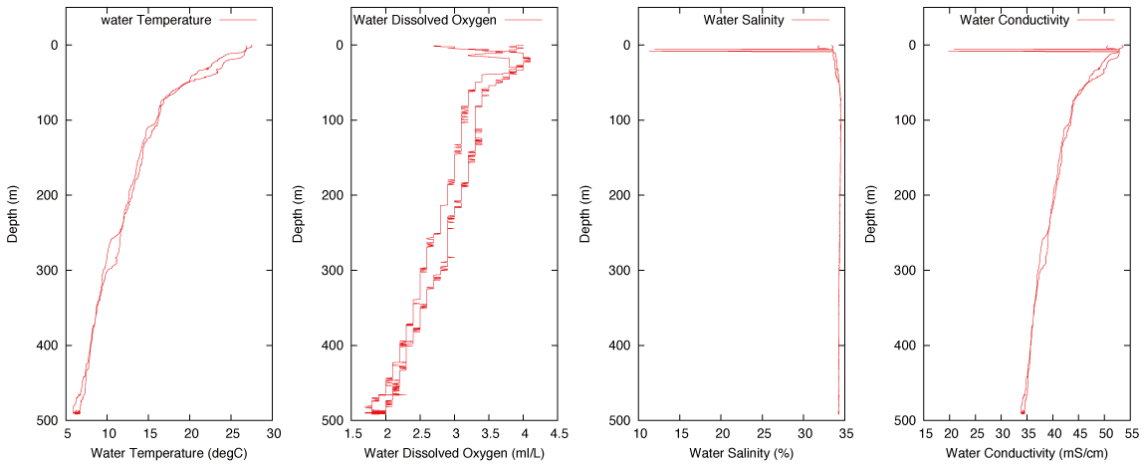
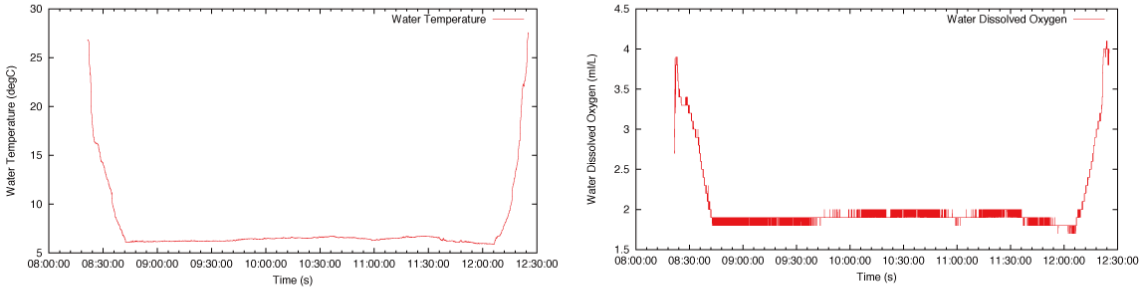


Fig. III-4 HPD CTD-DO Data

NT12-22, HPD #1427, 2012/08/24

Baby Makko site off Atami





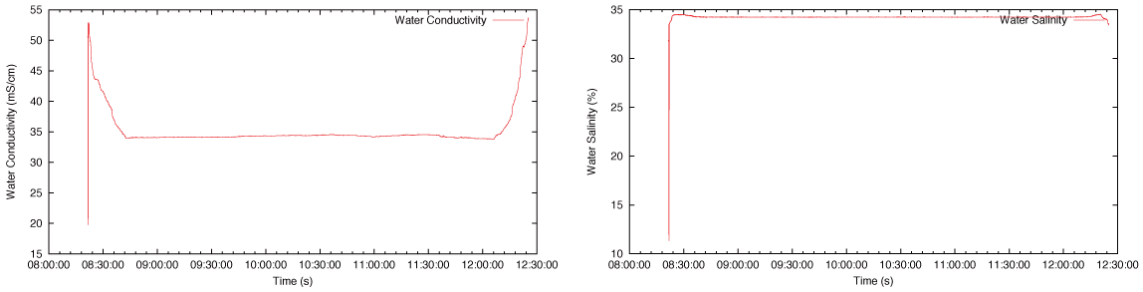
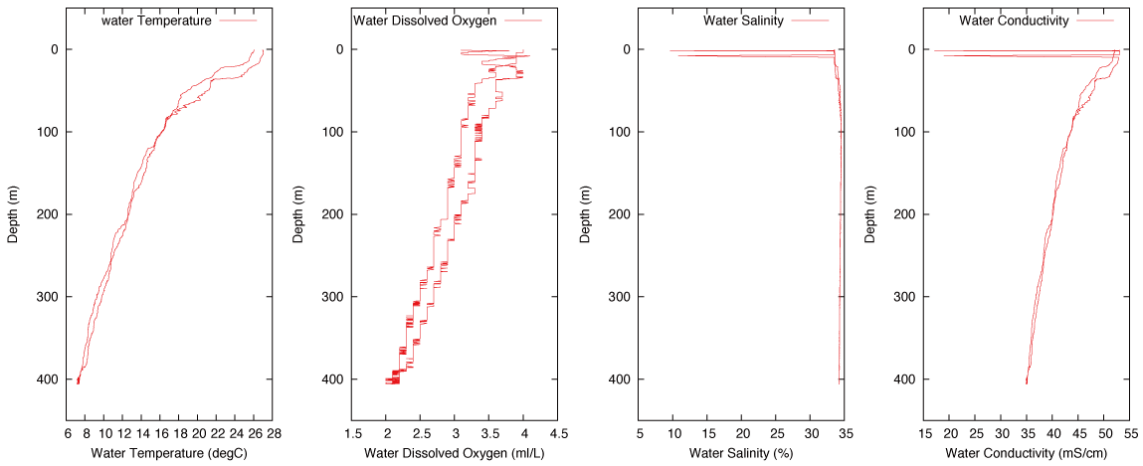
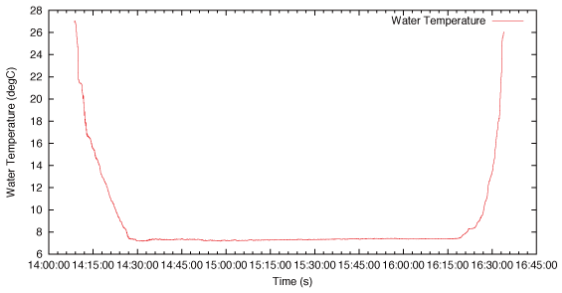


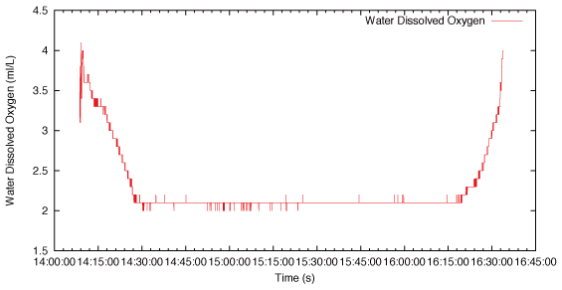
Fig. III-5 HPD CTD-DO Data

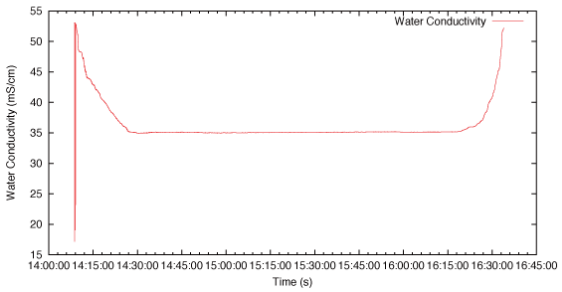
NT12-22, HPD #1428, 2012/08/24

Humpback whale site off Atami









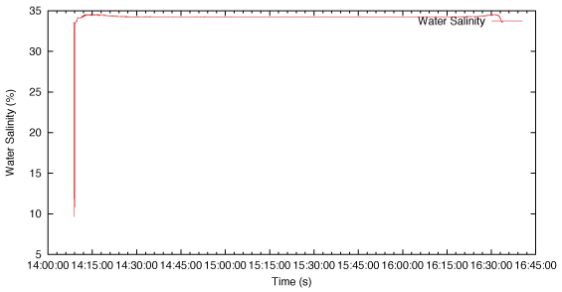
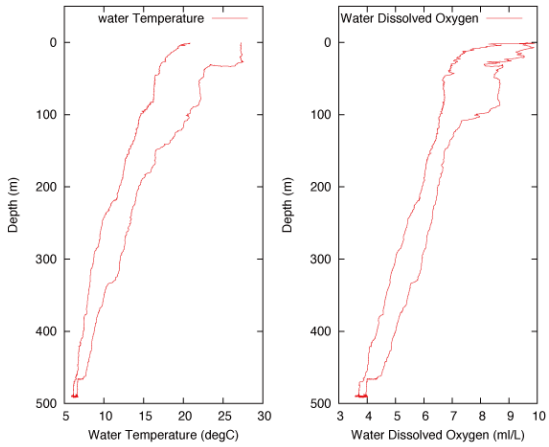


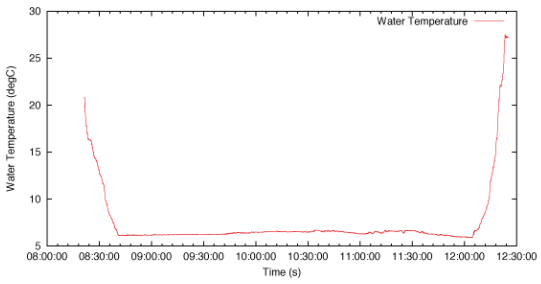
Fig. III-6 DO Data

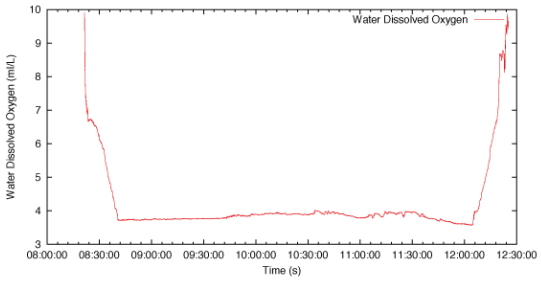
NT12-22, HPD #1427 & #1428, 2012/08/24

Baby Makko & Humpback whale site off Atami

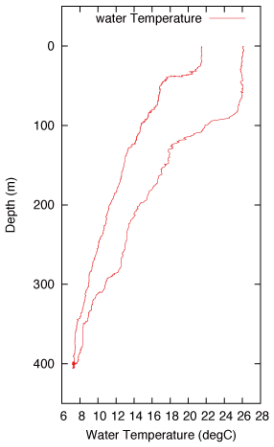
HPD #1427

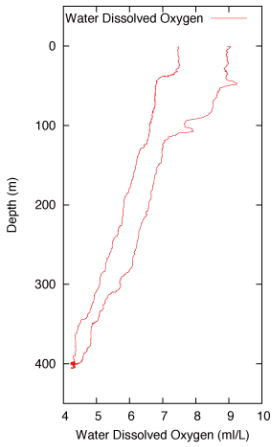


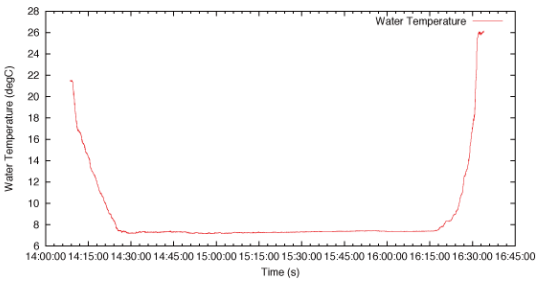




HPD #1428







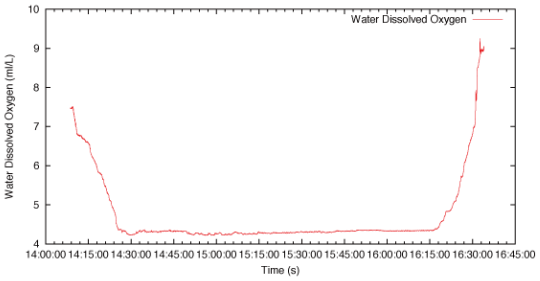
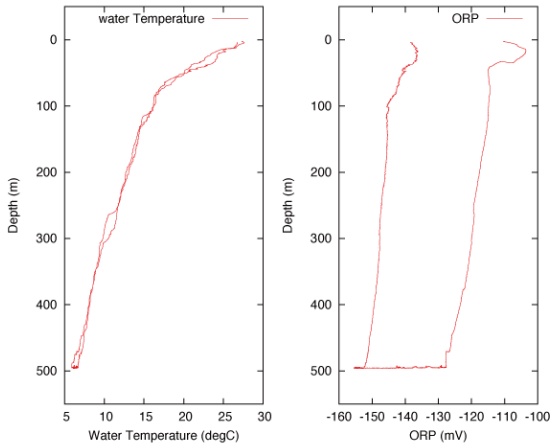


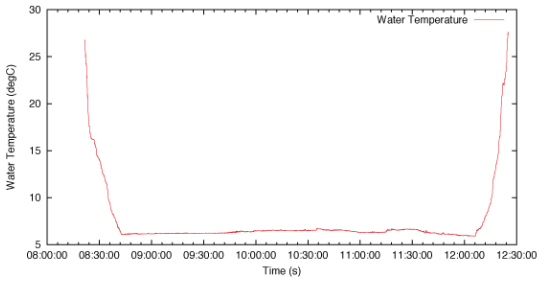
Fig. III-7 Redox Data

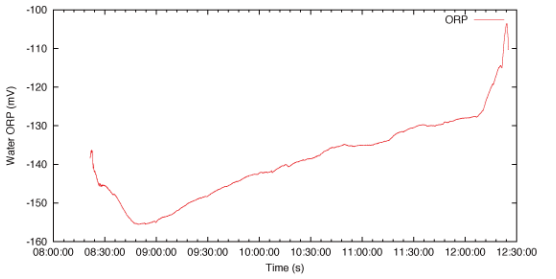
NT12-22, HPD #1427 & #1428, 2012/08/24

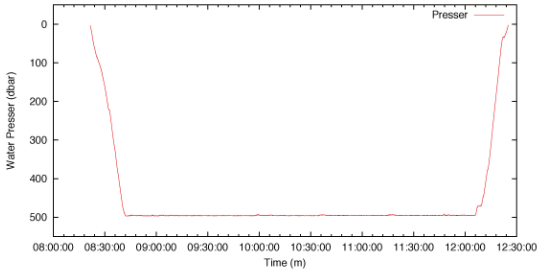
Baby Makko & Humpback whale site off Atami

HPD #1427

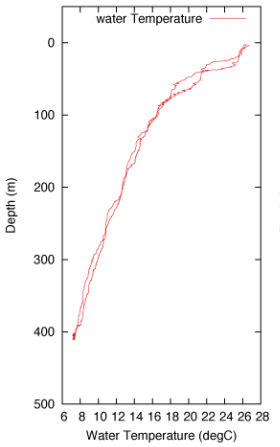


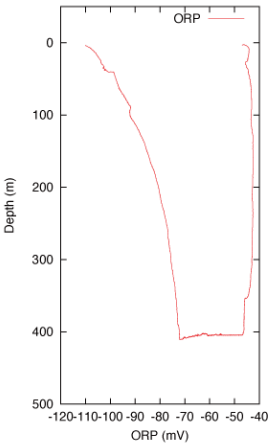


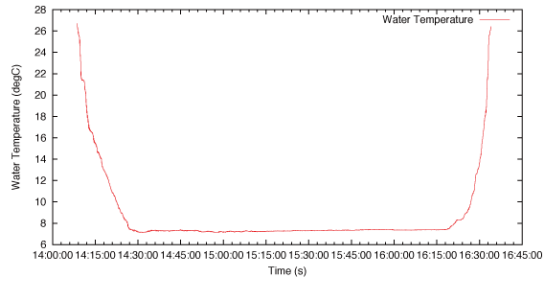


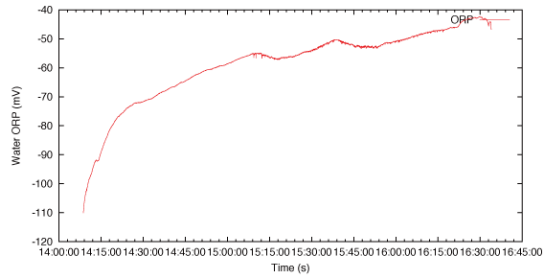


HPD #1428









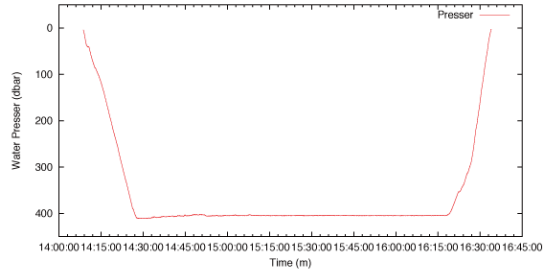
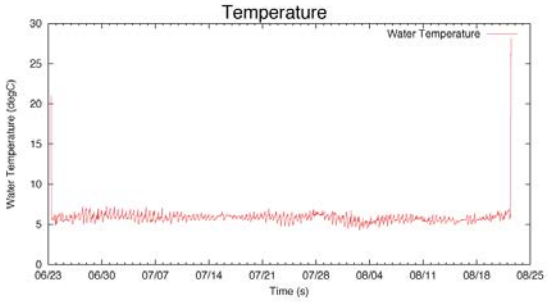
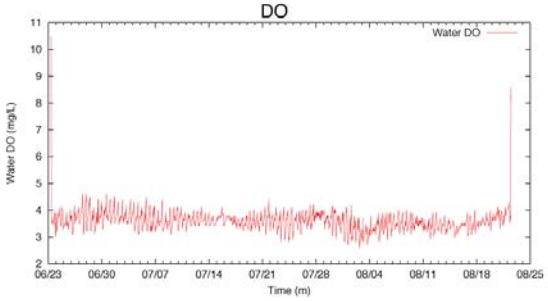


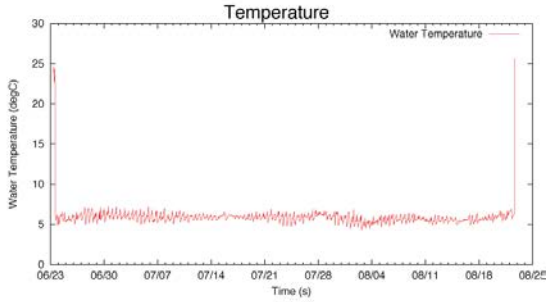
Fig. III-8 DO meter

Sediment trap No.1 (Near Baby Makko)





Sediment trap No.2 (Control)



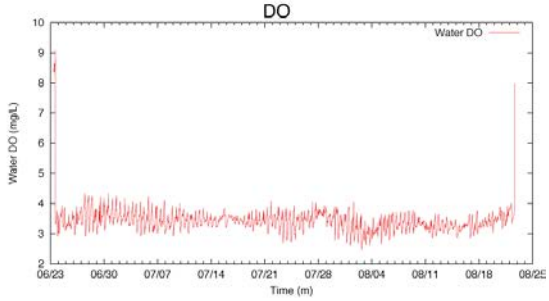
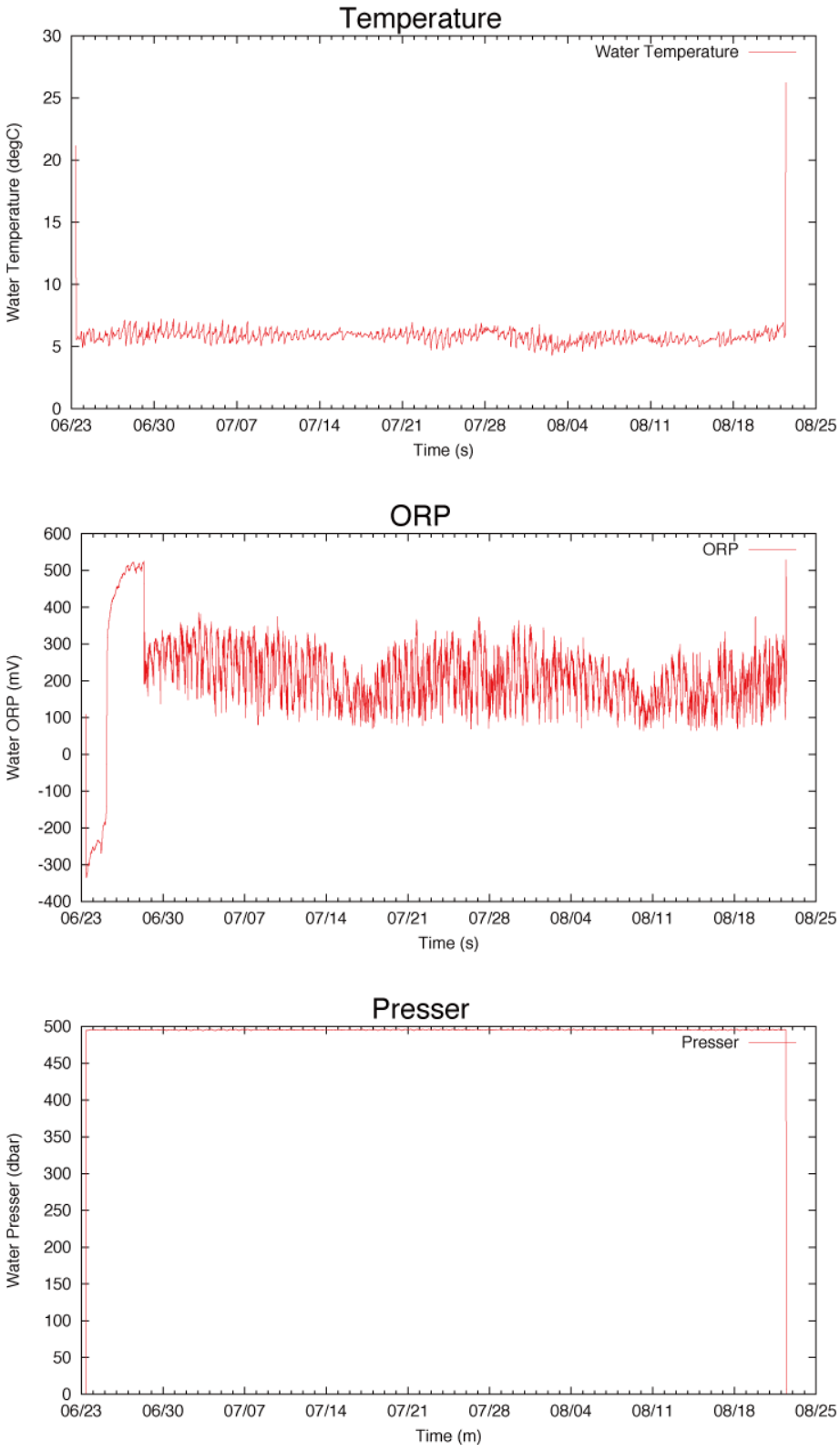


Fig. III-9 Redox meter

Sediment trap No.1 (Near Baby Makko)



III. XBT profiles

IV. Shipboard log

Date	Time	Description	Position/Weather/Wind/Sea condition(Noon)
21,Aug,12	9:00	On boarding Natsushima	8/21 12:00 (LST)
	10:00	Let go all shore line and left YOKOSUKA for	35-06N, 139-37E
		research area (OFF ATAMI) then used eng's and steered vaily	fine but cloudy
	10:50-11:20	Carried out education and training for scientists	South-4(modereate breeze)
	13:30	Arrived at research area	2(sea smooth)
	13:32	Released XBT at 35-04.4611N, 139-17.3402E	
	14:14	Carried out MBES mapping survey	
	16:32	Finished MBES mapping survey	
	16:40-17:00	KONPIRA SANPAI	
22,Aug,12	5:30	Finished drifting and com'ced proceeding to dive point	8/22 12:00 (LST)
	6:00	Arrived at above point and then used eng's vaily	35-06N, 139-10E
	8:07	Hoisted up H.P.D.	fine but cloudy
	8:11	Launched H.P.D., it dove and started her operation #1424	SSE-5(fresh breeze)
	8:48	H.P.D. landed on the sea bottom (D=488m)	3(sea slight)
	10:25	H.P.D. left the sea bottom (D=489m)	
	10:55	Hoisted up H.P.D.	
	11:06	Recovered H.P.D. then finished her operation	
	11:13	Recovered sediment trap and time laps camera	
	13:32	Hoisted up H.P.D.	
	13:36	Launched H.P.D., it dove and started her operation #1425	
	14:10	H.P.D. landed on the sea bottom (D=486m)	
	16:07	H.P.D. left the sea bottom (D=492m)	
	16:32	Hoisted up H.P.D.	
	16:38	Recovered H.P.D. then finished her operation	
	16:44	Recovered sediment trap and time laps camera	
	17:05-17:22	Carried out MBES mapping survey then com'ced proceeding to	
		TATEYAMAWAN then used ah'd eng's vaily	
	20:00	Arrived at TATEYAMAWAN then stop'd eng's and com'ced drifting her	
23,Aug,12	4:00	Arrived at research area (OFF BOSO)	8/23 12:00 (LST)
	4:32-6:12	Carried out MBES site survey	34-47N, 139-51E
	4:33	Released XBT at 34-46.5759N, 139-50.7301E	fine but cloudy
	8:08	Hoisted up H.P.D.	South-3(gentle breeze)
	8:12	Launched H.P.D., it dove and started her operation #1426	2(sea smooth)
	9:32	H.P.D. landed on the sea bottom (D=1508m)	
	13:00-13:30	Carried out weekly inspection for	
	16:19	H.P.D. left the sea bottom (D=1054m)	
	16:57	Hoisted up H.P.D.	
	17:02	Recovered H.P.D. then finished her operation	
	17:33-18:38	Carried out MBES mapping survey	
	21:45	Arrived at OFF HATSUSHIMA then stop'd eng's and com'ced drifting her	
24,Aug,12	4:45	Finished drifting and then used eng's, steered vaily	8/24 12:00 (LST)
	5:25-5:55	Carried out MBES mapping survey	35-06N, 139-10E
	6:20	Arrived at above point	fine but cloudy
	8:08	Hoisted up H.P.D.	SSE-2(light breeze)
	8:12	Launched H.P.D., it dove and started her operation #1427	2(sea smooth)
	8:42	H.P.D. landed on the sea bottom (D=487m)	
	12:04	H.P.D. left the sea bottom (D=489m)	
	12:32	Hoisted up H.P.D.	
	12:37	Recovered H.P.D. then finished her operation	
	12:42	Recovered time laps camera	
	13:55	Hoisted up H.P.D.	
	14:00	Launched H.P.D., it dove and com'ced her operation #1428	
	14:28	H.P.D. landed on the sea bottom (D=402m)	
	16:17	H.P.D. left the sea bottom (D=399m)	
	16:41	Hoisted up H.P.D.	
	16:46	Recovered H.P.D. then finished her operation	
	18:15	Stop'd eng's and com'ced drifting	

V. Deployment and retrieval list

Ship/SUB,ROV	11th Seiunmaru	Alucia /Triton3300						Natsushima/Hyper-Dolphin (NT12-15)		Natsushima/Hyper-Dolphin (NT12-22)		
Date / Deployment	6/8	6/10	6/11	6/12	6/14	6/15	6/16	6/23 HD#1394	6/23 HD#1395	8/22 HD#1424	8/22 HD#1425	8/24 HD#1427
Sperm whale calf "*SAITO*"	Free fall deployment at 35° 05.572'N, 139° 10.262'E, 487m depth											
Vertebrae of beeked whale						Free fall deploymnet at 35° 05.548'N, 139° 10.262'E, 488m depth						
Time-laplse still camera (S)				Deployed but fallen down 2～3m away from SAITO Rec started at 2:30	Re-deployment			Strobe light checked at 10:30				Recovery
Time-laplse video camera (V1) for long-term observation		Deployment 2～3m away from head Rec started at 13:35						Light checked at 11:37			Recovery	
Time-laplse video camera (V2) for short-term observation			Deployment 10m away from SAITO Rec start at 22:00		Re-deployment 2-3m away from head		Recovery	Deployment 2-3m away from head between V1 & S Rec started at 7:00		Recovery		
ADCP					Deployment 10m SE from SAITO						Recovery	
Sediment trap No.1 beside whale								Deployment 5m behind V1 (6-7m away from SAITO)		Recovery		
Sediment trap No.2 (background control)									Deployment 70m NE from SAITO at 35°05.585'N, 139°10.298'E, 491m depth		Recovery	
Timer Cam (NHK)							Deployment at vertebrae	Recovery	Deployment 2-3m away from SAITO	Recovery		
Bait trap											Deployment 10m SE away from SAITO (ADCP location) at 35° 05.570'N, 139° 10.269'E, 489m depth	Lost

VI. Miscellaneous photographs