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ROV Hyper Dolphin & R/V Natsushima CRUISE

NT09-06

Sagami Bay, central Japan

ONBOARD　REPORT

Chief Scientist
Katsunori Fujikura (JAMSTEC)

24 April –　6 May, 2009

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1. Cruise information

1.1. Cruise number: NT09-06

1.2. Ship name: R/V Natsushima, ROV Hyper Dolphin

1.3. Title of the cruise: 平成 21 年度　深海調査研究「ハイパードルフィン」調査潜航

1.4. Proposals:

課題 1) What is biological differences between Calyptogena soyoae and C. okutanii?　シロウリガイとシマイシロウリガイの違いは何か？（課題提案者：藤倉克則 JAMSTEC）

課題 2) 堆積物ー水境界における親生物素循環の解明のための、幅、奥行き、深さ、時間の四次元観測手法の確立（課題提案者：小栗一将 JAMSTEC）

課題 3) Succession patterns and colonization mechanisms of chemosynthetic organisms associated to whale falls in Sagami Bay　初島北東沖鯨骨生物群集の遷移と移入機構に関する研究（課題提案者：Florence Pradillon, JAMSTEC）

1.5. Cruise period: Leg1-1, 2009/4/24-2009/5/3, Leg1-2, 2009/5/3-2009/5/6

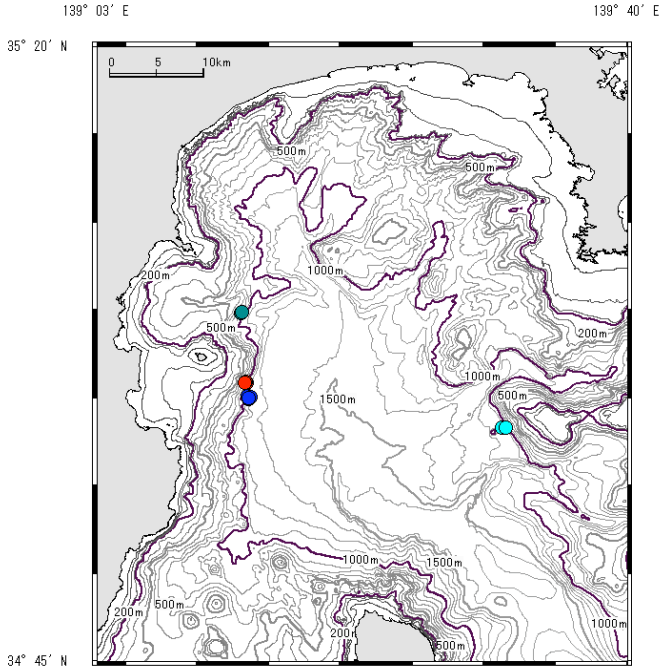
1.6. Port call:

出港地---JAMSTEC, 2009/4/24

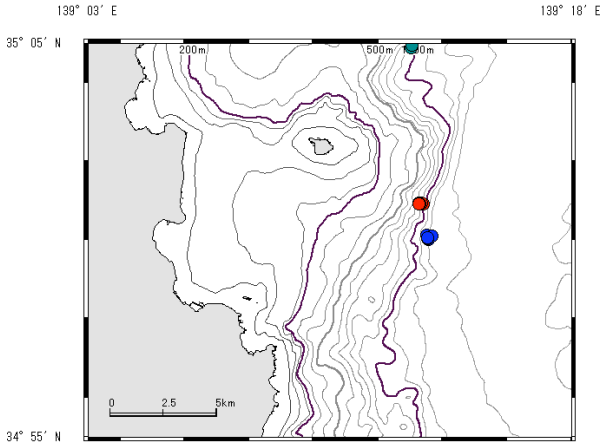
途中研究者交替地--- Off port of Misaki, 2009/5/4

到着地--- JAMSTEC, 2009/4/24

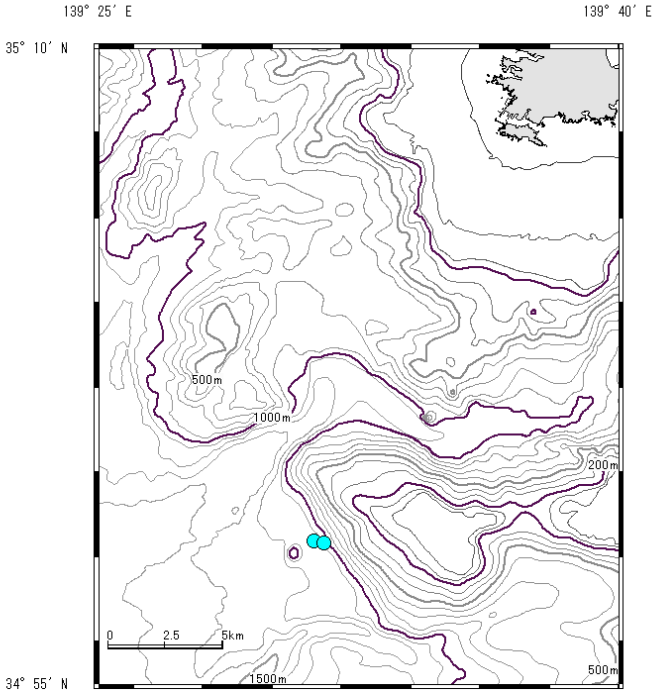
1.7. Research area: Off Hatsushima Island, NE Off Hatsushima Island and Okinoyama Bank sites in Sagami Bay



潜航地点



初島沖潜航地点



沖ノ山堆潜航地点

2. Researchers

2.1 Chief Scientist

Katsunori Fujikura／藤倉　克則 独立行政法人海洋研究開発機構 海洋・極限環境生物圏領域 海洋生物多様性研究プログラム

2.2 Representative of science party

(1) Katsunori Fujikura／藤倉　克則「シロウリガイとシマイシロウリガイの違いは何か？」
(2) Florence Pradillon「初島北東沖鯨骨生物群集の遷移と移入機構に関する研究」
(3) Kazumasa Oguri／小栗　一将「堆積物－水境界における親生物素循環の解明のための、幅、奥行き、深さ、時間の四次元観測手法の確立」

2.3. Science party

＜乗船研究者＞

独立行政法人海洋研究開発機構海洋・極限環境生物圏領域
- Amandine Nunes Jorge
- Fujikura, Katsunori 藤倉　克則
- Fujiwara, Yoshihiro 藤原　義弘
- Furushima, Yasuo 古島　靖夫
- Hongo, Yuki 本郷　悠貴
- Hori, Sayaka 堀　沙耶香
- Kawato, Masaru 河戸　勝
- Maruyama, Tadashi 丸山　正
- Miyazaki, Masayuki 宮崎　征行
- Nagahori, Atsushi 永堀　淳志
- Nakamura,Yoshimitsu 中村　欽光
- Oguri, Kazumasa 小栗　一将
- Pradillon, Florence
- Seo, Eriko 瀬尾　絵理子
- Shinozaki, Ayuta 篠崎　鮎太
- Takahashi, Yoshimi 高橋　幸愛
- Tame, Akihiro 多米　晃裕
- Toyofuku, Takashi 豊福　高志
- Watanabe, Hiromi 渡部　裕美
- Yoshida, Takao 吉田　尊雄

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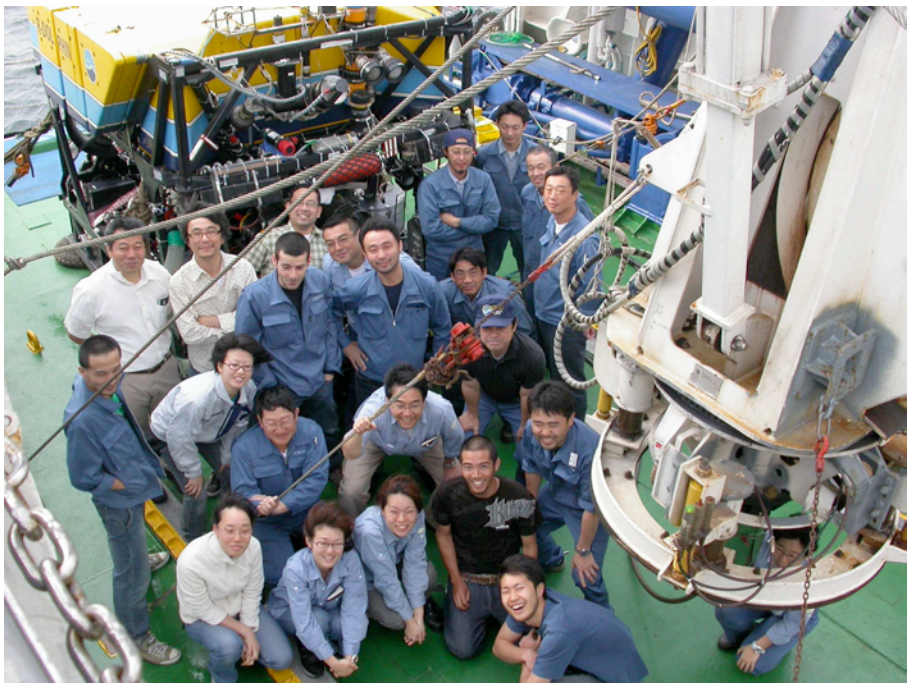
- Iwamoto, Kensuke 岩本　健輔



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（1– 1）初島沖の水深 800-900 m サイトと 1100 m サイトにて，アシッドブルー染色液でシロウリガイ類貝殻の露出部を in-situ で染色した．染色されない埋没部の長さから，それぞれの種やサイズごとに埋在深度の相違を解析する．染色方法は，a)底の開いた透明ボックスでシロウリガイ類の密集域（10 個体程度）を覆い（Fig. 3.1.2.1），b)水中ポンプで染色液をボックス内に注入（Fig. 3.1.2.2），c)約 10 時間後に電触リリーサでボックス上部の蓋を開け，d)シロウリガイ類を回収した．

（1– 2）MT コアや MBARI コアでシロウリガイ類生息域の堆積物を採集し，硫化物濃度測定を行った．測定は，硫化水素用マイクロセンサ（unisense, H2S-50）および ph メーターを用い，堆積層数 mm 間隔で測定した．3.9 Environmental measurements　参照．

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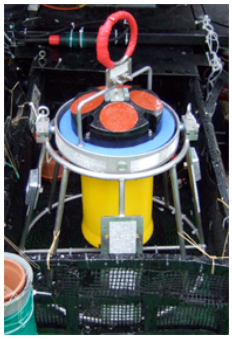
（2– 2）初島沖の水深 800-900 m サイトと 1100 m サイトのシロウリガイおよびシマイシロウリガイの生殖腺から成熟卵，精子を取り出し（＊2），濾過海水中で人工授精を試みた．受精卵（と予想される卵）を 5℃，10℃のインキュベータで飼育し発生を観察する．a）軟体部の生殖腺部分を切開し配偶子を取り出す．切開する前に成熟個体は配偶子が透けて見える，b）表層海水および水中ライト＋温度計＋ボックス内から採水した海水（いずれも 0.22μm のフィルターで濾過したもの）中で体内から取り出した配偶子を用いた受精を試みる，c）また，生殖線から取り出した卵を低温濾過海水中で洗浄した後，濾過海水で希釈した精子に懸濁させ，人工授精を試みる，d）b, c それぞれ 5℃，10℃のインキュベータで飼育し発生観察．

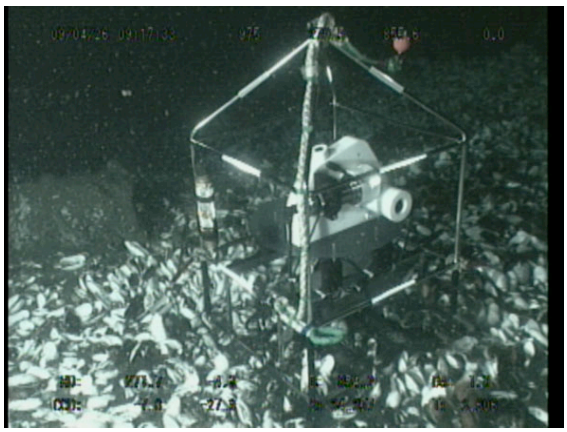
（2– 3）シロウリガイおよびシマイシロウリガイの生殖腺から成熟卵，精子を取り出し，パーコールによって比重推定．3.3. Symbiosis: Characterization of Calyptogena gamete を参照．

（2– 4）ADCP によって流向流速を観測し，卵や幼生の分散距離を評価．
a)初島沖 800-900 m サイトに 2009/4/25(#973)で設置，b)設置場所はシロウリガイ類コロニーから約 5 m 離れた泥堆積域，c）ジンバル機構のフレームに取り付けたため垂直方向に向いている，d）サンプリング設定 5 分インターバル，2m 間隔で上向きに 60 層分の水平流および鉛直流の計測を行えるように設定 e) 2009/5/4 (#987)で回収。



（2– 5）初島沖の水深　800-900m サイトのシロウリガイ類群集上に動物プランクトンサンプラー（ZPS）を設置し，シロウリガイ類の卵および幼生の採集を試みた（#975）．ZPS には，目合 100μm のメッシュを設置し，1 時間おきに 1 分間，20L/分の採集を 48 時間実施するよう設定し

た．ZPS には，5%パラホルムアルデヒドを充填し，採集されたサンプルが随時固定されるようにした．ZPS は#980 にて回収し，作動内容の確認とサンプルの回収を行った．サンプルは，70%エタノールに置換し，陸上へ持ち帰る．サンプル内容物の同定は，陸上実験室内の顕微鏡下で観察を行う予定である．



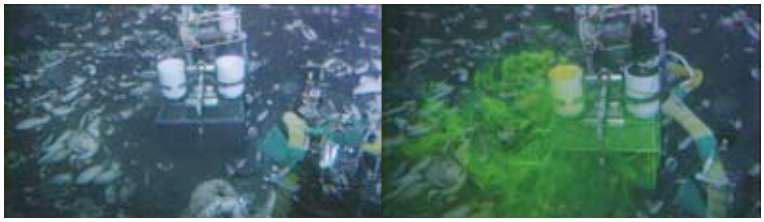
図．#975 にてシロウリガイ類群集上に設置した ZPS

（3）シロウリガイ類成熟サイズの解明
a）初島沖の水深 800-900 m サイトと 1100 m サイトにてシロウリガイおよびシマイシロウリガイの殻長 10 - 70 mm 以下の個体を採集．b）生殖腺組織切片用にブアン固定試料を作成．ブアン固定試料は約 24 時間後に 70%エタノールに置換して保存．c）種同定用に外套膜の一部を 70%エタノールで固定．

（4）シロウリガイ類の分布特性
（4– 1）初島沖の水深 800-900 m サイトと 1100 m サイト，沖ノ山堆のシロウリガイ類の種組成および性比を比較．a）船上では各潜航 3– 8 個体を目安に（11）の手法を用いて種判別を行う．b）サンプルは集団解析実験や共生実験用とシェアし，外套膜の一部を 99.5%エタノールで固定・保存．下船後，保存した外套膜から DNA 抽出を行い，全ての個体に関して(11)の手法で種判別を行うとともに，一部の個体はミトコンドリア COI 遺伝子の DNA 塩基配列を確認する．c）性比は，生殖腺部を解剖し卵と精子の存在で区別．

（5）シロウリガイ類の交雑防止メカニズムの解明
（5– 1）（＊1）および（＊2）で得られた精子, 卵を電子顕微鏡で観察するための試料作成. 3.3. Symbiosis: Characterization of Calyptogena gamete を参照.

（6）シロウリガイ類の成長速度の推定
初島沖の水深 800-900 m サイトと 1100 m サイトにて実施．a）塩化ストロンチウム六水和物とカルセインを海水に溶かした溶液を, マーキング液とした. b) 底の開いた透明ボックスでシロウリガイ類の密集域（10 個体程度）を覆い， b）水中ポンプでマーキング液をボックス内に注入，c）約 17 時間で貝殻に塩化ストロンチウム六水和物とカルセインをマーキングさせるために 17 時間後に電触リリーサでボックス上部の蓋が開く, d) これら実験個体は 2010 年 1 月のクルーズで回収予定. e) これら一連の in situ 実験を#977&981（800-900mサイト）で計 2 回, #984&989（1100mサイト）で計 2 回の総計 4 回行った.



（7）ツブナリシャジクの初期生活史の解明
先行研究にて，相模湾初島沖の特定の露頭のみに生息する大型の腹足類ツブナリシャジクが，特徴的な形状

を持つ卵カプセルをシンカイヒバリガイ類の貝殻上に産みつけることが明らかになっている(Watanabe et al. 2009)．本航海では，先行研究で明らかにすることができなかったツブナリシャジクの卵カプセルの内容物と幼生の生態を明らかにするため，初島沖 1100 m サイト（第 974 潜航）にて長期ステーション付近の変色域内にある露頭から，ツブナリシャジクの卵カプセル付きシンカイヒバリガイ類を採集した．卵カプセルの一部は，10%フォルマリンで固定し，下船後に顕微鏡下で詳細な観察を行う．残りは， 5℃および 10℃のインキュベータで飼育し，成長および成長にかかる時間を観察する．航海終了後は陸上実験室にて飼育と観察を継続予定．

（8）サガミマンジガイの初期生活史と成熟サイズの解明

（8– 1）サガミマンジガイの初期生活史：初島沖 1100 m サイト（第 974，978 潜航）の長期ステーション付近の変色域内でサガミマンジガイを採集した．サガミマンジガイの成体貝殻表面に卵カプセルらしきものが付着していた．また，第 978 潜航ではサガミマンジガイの密集域内にあったポテトチップスの袋に多量の卵カプセルが付着しており，採集した．サガミマンジガイの卵塊の形態等は明らかになっていないので，まず，DNA 塩基配列の比較から，サガミマンジガイの卵カプセルを同定する．下船後，卵カプセルから DNA 抽出を行うため，採集した卵カプセルの一部は 99.5%エタノールで固定するとともに，形態・生態観察用に 10%フォルマリンでも固定した．残りの卵カプセルは，濾過海水にて 5℃および 10℃のインキュベータで飼育し成長および成長にかかる時間を観察する．航海終了後はラボにて飼育と観察を継続予定．

（8– 2）サガミマンジガイの成熟サイズ．a）大中小のサイズを選択．生殖腺組織切片用にブアン固定試料を作成．ブアン固定試料は約 24 時間後に 70%エタノールに置換して保存．

（9）ヘイトウシンカイヒバリガイの成熟サイズの解明

（9– 1）a）初島沖 800-900 m サイトおよび 1100 m サイトにて大中小のサイズを選択．総計 60 個体以上．b）生殖腺および外套膜を組織切片用にブアン固定試料を作成．ブアン固定試料は約 24 時間後に 70%エタノールに置換して保存．c）エラは共生細菌量推定のために−80℃で冷凍．d）足，閉殻筋のいずれかを遺伝子による種判別用に−80℃で冷凍．e）サンプルは殻、外套膜、消化腺、足を今井氏（琉大）の集団解析や共生グループとシェア．

（１０）化学合成生態系―光合成生態系の連鎖構造の解明

（10– 1）a）初島沖 800-900 m サイト，1100 m サイトおよびそれらの周辺にて，化学合成生物群集の固有種とゲスト種を採集．対象生物：シロウリガイ，シマイシロウリガイ，ヘイトウシンカイヒバリガイ，シンカイヒバリガイ，Alaysia，Lamellibrachia，サガミハイカブリニナ，サガミマンジ，シンカイシタダミ，ヨコエビ，ハナシガイ類，Bathyacmaea，コノハエビ，ゲンゲ類，ツブナリシャジク，スエヒロキヌタレガイ，ウミグモ類，ホシムシ類，多毛類，エゾイバラガニ，オシロイエゾボラ，ソウヨウバイ，Nicomache ohtai，クモヒトデ類，スナヒトデ類，ゴカクヒトデ類，シギウナギ，ホラアナゴ，他魚類 2 種など．b）アミノ酸の N 同位体比，C，N，S 同位体比測定用に−80℃で冷凍．c）沖ノ山堆にてハゲナマコおよびスエヒロキヌタレガイ 1 個体ずつ採集（同位体解析に使える）．

（１１）シロウリガイとシマイシロウリガイの短時間種判別方法の確立（＊２）

相模湾のメタン湧水域には，シロウリガイとシマイシロウリガイが生息している．両者は形態的に統計的に有意な差があるものの，中間的な形態を示す個体があるため，ミトコンドリア DNA の部分塩基配列を用いて種判別を行う場合が多い．そこで，これまで得られている塩基配列情報を用いた種判別マーカーを作成し，船上にて短時間でシロウリガイとシマイシロウリガイの判別を可能にした．本航海では，初島沖 800-900m サイト（#973, #975, #977），1170m サイト（#974, #978, #979），沖ノ山堆（#985, #986）から採集したシロウリガイ類計 62 個体について船上で種判別を実施した．

（１２）シロウリガイ類寄生性コペポーダの形態および飼育

a）シロウリガイ類のエラを海水中に取り出す，b）しばらくおいておくとエラからコペポーダが出てくる，c）10%フォルマリンとエタノールに固定，一部-80℃で冷凍，d）卵のみと親個体と卵のセットをそれぞれ

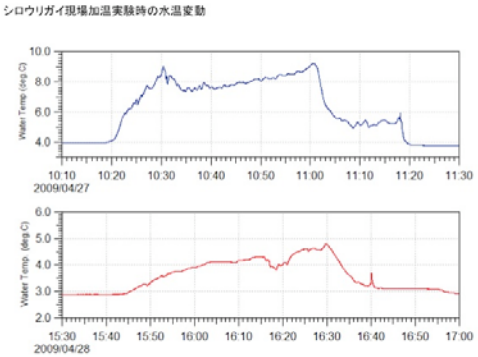
5℃と 10℃のインキュベータで飼育．e) 一日一度水換えを行う．

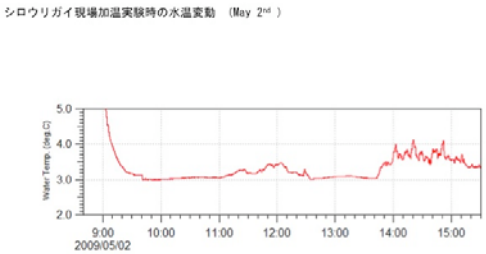
（１３）ハナシガイ類成熟サイズの解明
a）初島沖の水深 800-900 m サイトにてハナシガイ科オウナガイの殻長 80 mm 以下の個体を採集．b）生殖腺組織切片用にブアン固定試料を作成．ブアン固定試料は約 24 時間後に 70%エタノールに置換して保存．FISH 切片用フォルマリン固定試料を作成．c）種同定用に足と外套膜の一部を 70%エタノールで固定．

3.1.3. Results (expected)

（１）シロウリガイ類のすみわけメカニズムの解明
（1– 1）アシッドブルー染色液では，貝殻は明確に染色できなかった．したがって，シロウリガイとシマイシロウリガイの埋没深度の評価はできなかった．特に殻長 50 mm 以下の個体では，殻皮で覆われ覆われているため，表面はきわめてなめらかになる（透明フィルムを貼られたように）．これらの個体への染色は今回のやり方では不可能と思われる．一方で，貝殻の色彩を詳細に見ると，埋没部が黒色になる傾向が見られた．この黒色部を平均埋没部と仮定し，シロウリガイとシマイシロウリガイの埋没深度と硫化水素濃度との関係を比較してみる価値はあると思われたため解析を試みる予定．
（1– 2）MT コアや MBARI コアで得られた堆積物中の硫化水素濃度．3.9 Environmental measurements 参照．

（２）シロウリガイ類の初期生活史と分散ポテンシャルの解明
（2– 1）a）最初の 2 回の in situ 実験，初島沖の水深 800-900 m サイト（＃976）と 1100 m サイト（＃979）では放卵放精は認められなかった．＃976 では，ボックスで覆ってから，シロウリガイ類を落ち着かせる時間が短すぎたこと，ボックス内の個体がほとんどメスであったため放精が起きず放卵も誘導されなかったことが原因と考えられる．なお，ボックス内の水温変化はライト点灯により最大約 X ℃の上昇が認められた．＃979 では，ライト点灯後の水温上昇が#976 ほど顕著ではなく，約 2℃程度であった．温度上昇が不十分だった可能性もある．ライト点灯中に海水の揺らぎがあったため，過度な温度上昇をさけようと途中何度かライトをオフとしたことも温度上昇を妨げた．b）沖ノ山堆（＃986）では，ボックスを堆積物中にしっかりと埋没させ設置した．ライト点灯後から約 1 時間 30 分後に 1 個体が放精，その数分後に放卵が観察できた．ボックス内からの採水サンプルを目合 100μm のメッシュで濾過し，371 個の卵を採集した．採集できた卵のうち 100 個を冷凍保存，100 個を電子顕微鏡観察用に 2.5%グルタルアルデヒドで固定，100 個を４%パラホルムアルデヒドで固定し，残りの 71 個の卵を飼育用とした．精子は 0.2 μm のメッシュで濾過し，濾紙に付着させた．濾紙は３等分した後，電子顕微鏡観察用 2.5%グルタルアルデヒド固定，DNA 抽出用 99.5%エタノール固定，4%パラホルムアルデヒド固定し，下船後，それぞれの観察に用いる．これらにより，シロウリガイ類の共生細菌の繁殖，発生，成長の一端が明らかにできる予定である．





（2– 2）人工授精による飼育実験

10℃では卵の形態が崩れてしまい，飼育が難しい．船上では発生が進んでいるのか詳細な観察ができていないが，下船後も 5℃にて飼育を継続する予定である．本実験により，シロウリガイ類の発生，成長の一端が明らかにできる予定である．

（2– 3）シロウリガイおよびシマイシロウリガイの生殖腺から成熟卵，精子を取り出し，パーコールによって比重推定．3.3. Symbiosis: Characterization of Calyptogena gamete を参照．

（2– 4）ADCP によって流向流速を観測し，卵や幼生の分散距離を評価．

ADCP で得られた，2009 年 4 月 25 日から 5 月 4 日における，南北成分の流速および東西成分の流速の変動をそれぞれ図 1，図 2 に示した。

平均流速は 6cm/sec 程度で，1knot を超える強い流れは第 42 層（海底から約 90m 上層）以浅で僅かに見らる程度であった。4 月 29 日に海底から 30m 上層付近まで北寄りの強い流れが見られた。また，5 月 3 日には，水深 40m 層付近から上層で 30cm/sec 程度の北寄りの強い流れが見られた。同時期に，東西成分の流速には顕著な変化は見られなかった。

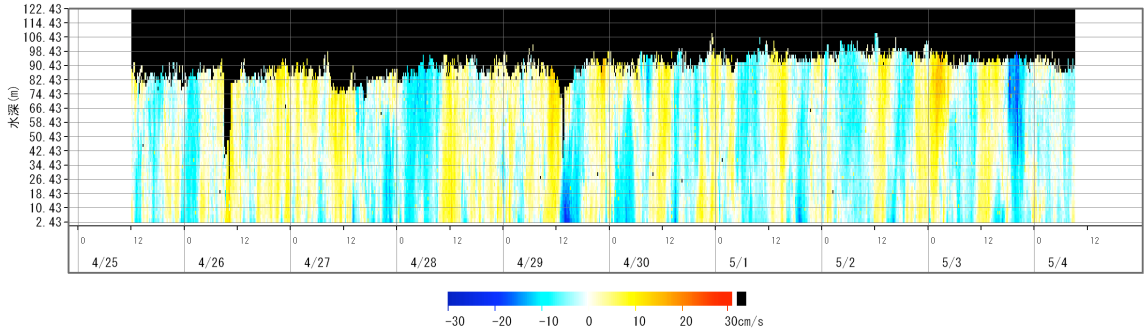


図 1　流速の南北成分の変化
図中の正の値は北向きの流速を，負の値は南向きの流速を表わす。

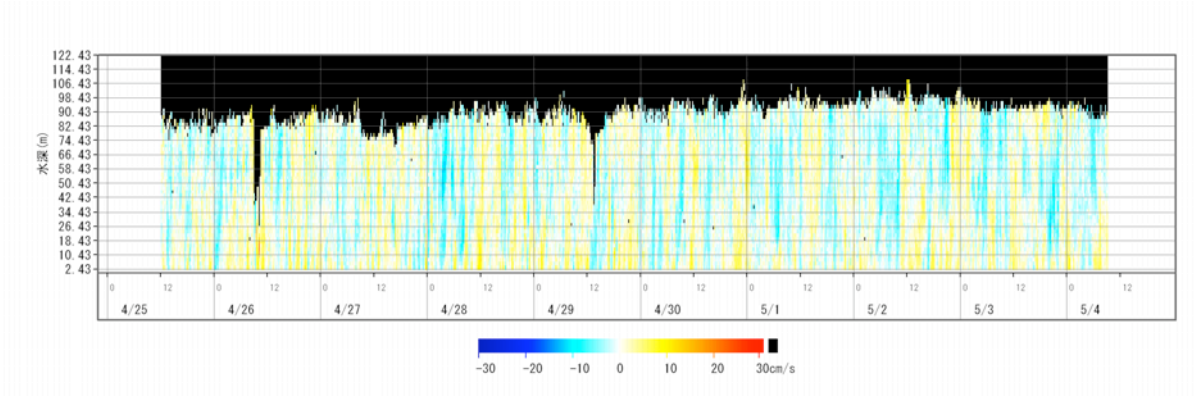


図 2　流速の東西成分の変化
図中の正の値は東向きの流速を，負の値は西向きの流速を表わす。

全 60 層で得られた流向・流速の変動を図 3 に示した。相模湾初島沖の深海底近傍では，潮汐に依存した北～北東および南西～南東向きの流れが卓越する。この流向の変化は，相模湾の海底地形や湾内に卓越する左遷環流の影響を反映している結果であると推察できる。さらに，潮汐に依存した北東－南西向きの流れの変動は，上層に向かって弱まる傾向が見られた。

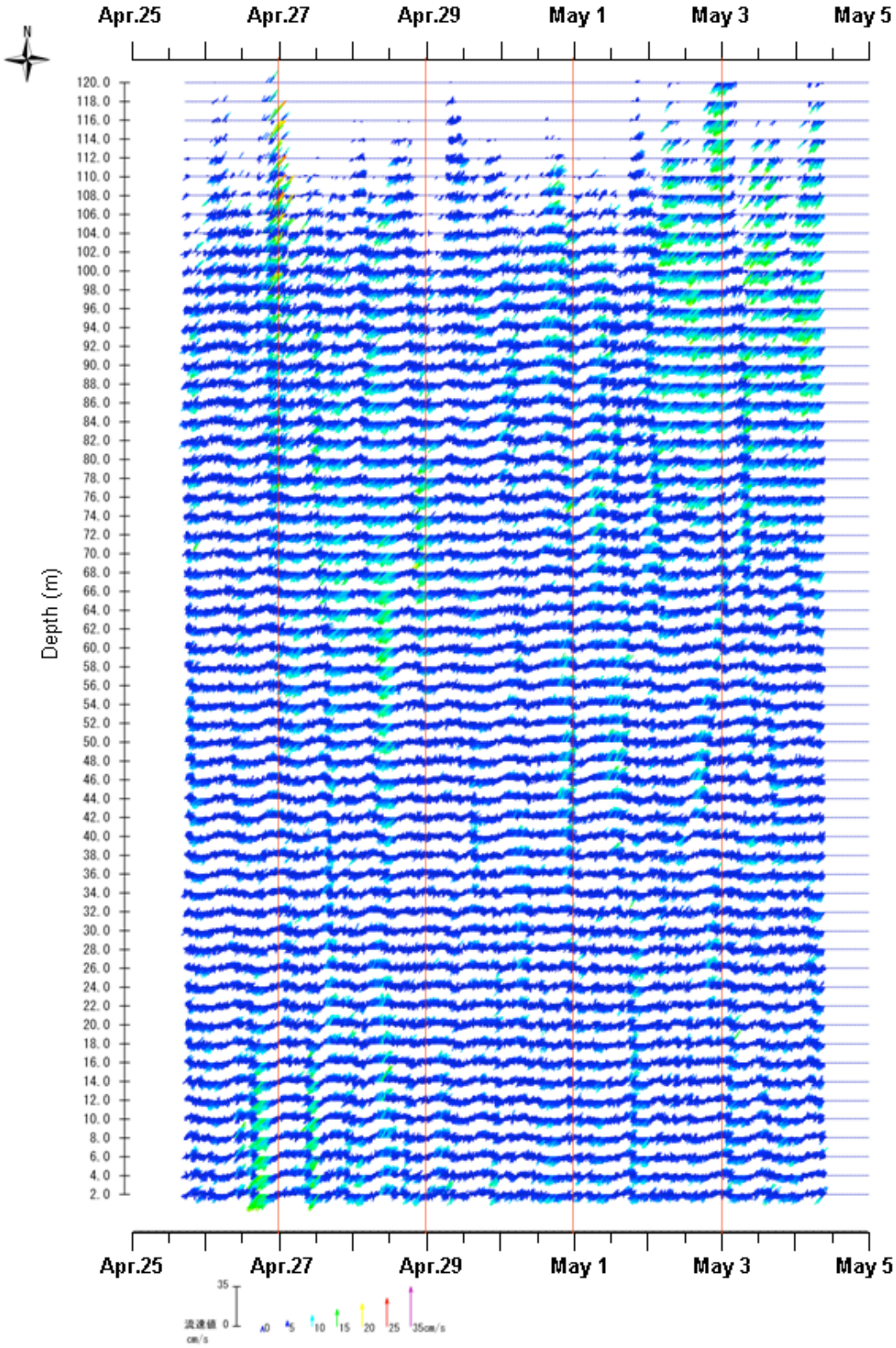


図３　ADCP で得られた全 60 層における流向・流速の変化

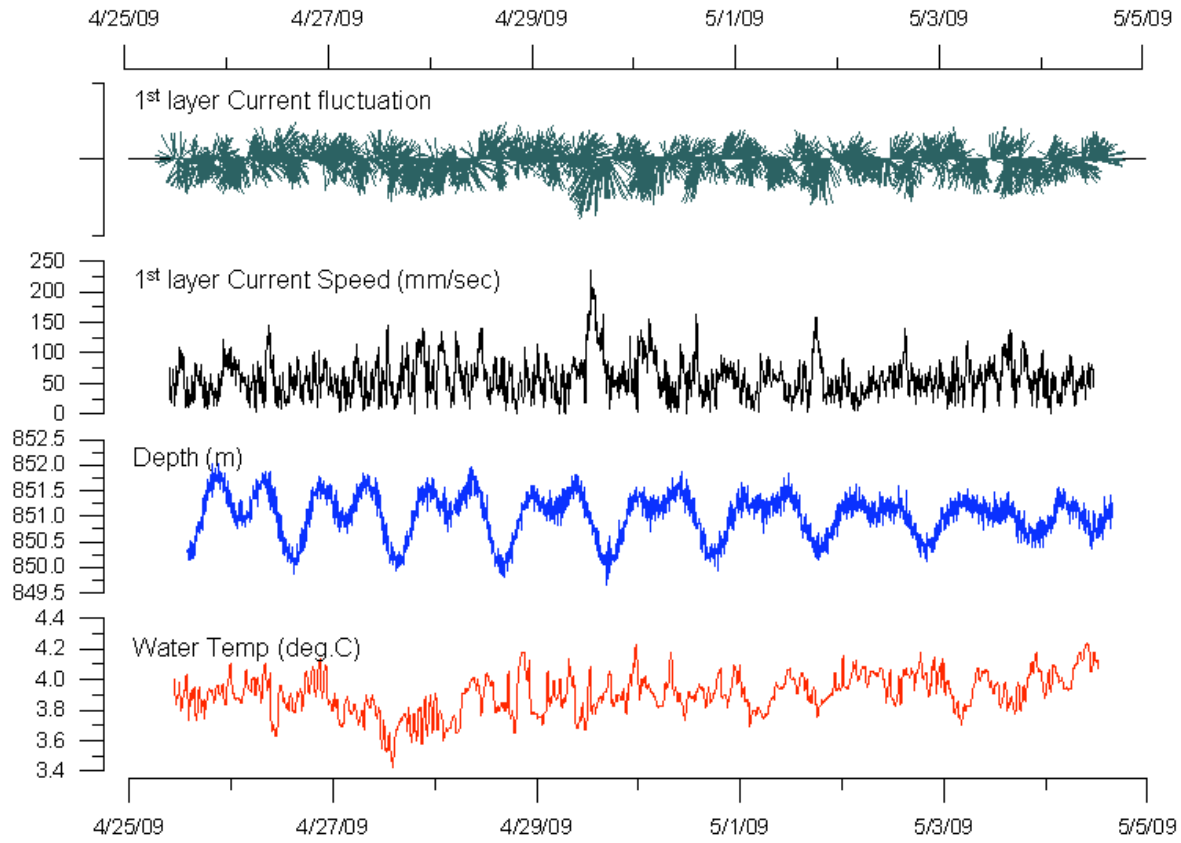


図 4　ADCP で得られた水温，水深の変動と第 1 層の流向・流速の変動

図 4 に，ADCP で得られた海底近傍の水温変動，水深の変動，第 1 層目の流速の変動，および第 1 層目の流向・流速の変動を示した。水温は概ね 3.4℃から 4.2℃の間で変化しており，4 月 28 日の昼頃に最低値が見られた。また，水深（水圧）の変化は，潮位変動を反映しており，大潮から小潮に向かう時期であることが推測できた。流れは，水位が上昇するとき，すなわち上げ潮時には北寄りの流れになり，下げ潮時は，南寄りの流れになる。先にも記したとおり，流向は地形的な影響を受ける。4 月 29 日に 25cm/sec の強い南向きの流れが見られる。このような強い流れがあるときは，海底地形に沿った南向きになるが，流速が約 10cm/sec より弱い場合は，斜面を滑り落ちる方向，すなわち南東方向の流れが卓越する傾向が見られた。この流向を変化させる可能性のある流速の閾値については解析を進めている。おそらく，シロウリガイ類の卵・幼生の分散を考える場合，流れの強弱によって，その輸送方向が変わる可能性が推測できた。あるいは，シロウリガイ類が放卵・放精する場合の適流速値（繁殖効率が上がる速度）が存在するかもしれない。

シロウリガイ類の卵・幼生が，初島沖深海底近傍の流れに依存して分散すると仮定した場合，どの方向にどの程度の距離の移動が可能であるかを調べるため，ADCP で得られた第 1 層目の流向。流速データを用いて進行ベクトル図を作成した（図 5）。その結果，観測期間中の約 9 日間で，南東方向に約 16km 移動が可能であと推算できる。しかしながら，シロウリガイ類の卵・幼生は，分散過程において海底地形の影響による乱れ（乱流）や鉛直方向の流れの影響を受けるだろうから，実際の分散距離は 16km よりも少ないと考えられる。分散に関しては，今回の計測結果をはじめ，他の環境要因や生物が持つ変動要因を加味したモデル解析が必要であるだろう。

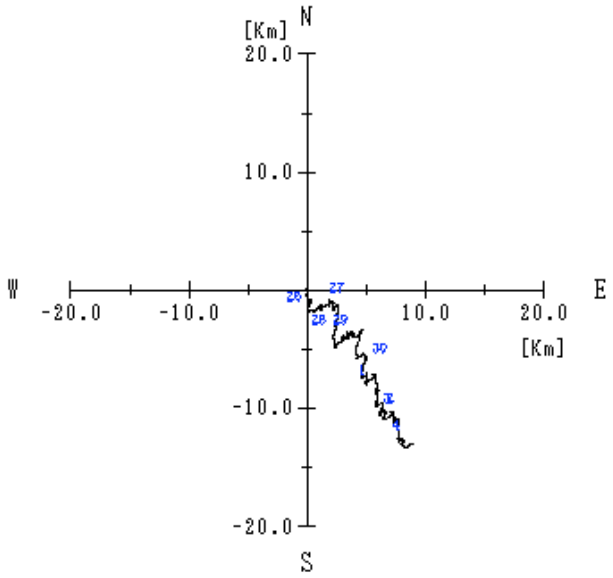


図 5　ADCP で得られた第 1 層目の流向・流速から求めた進行ベクトル図

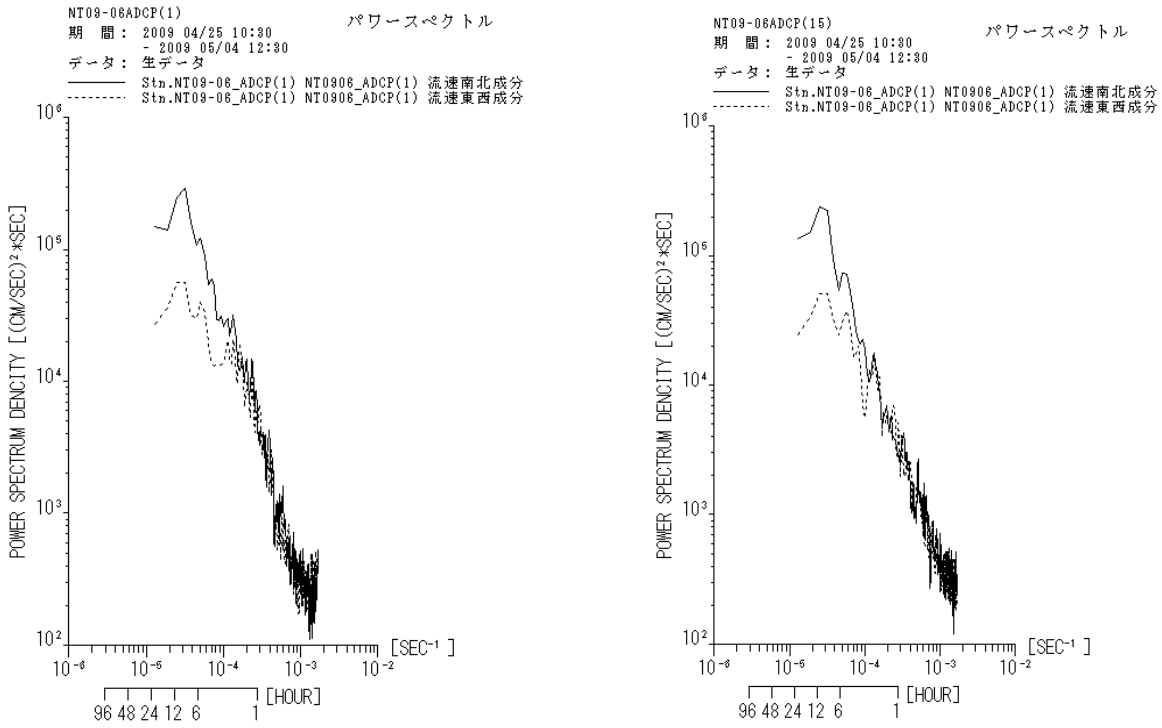
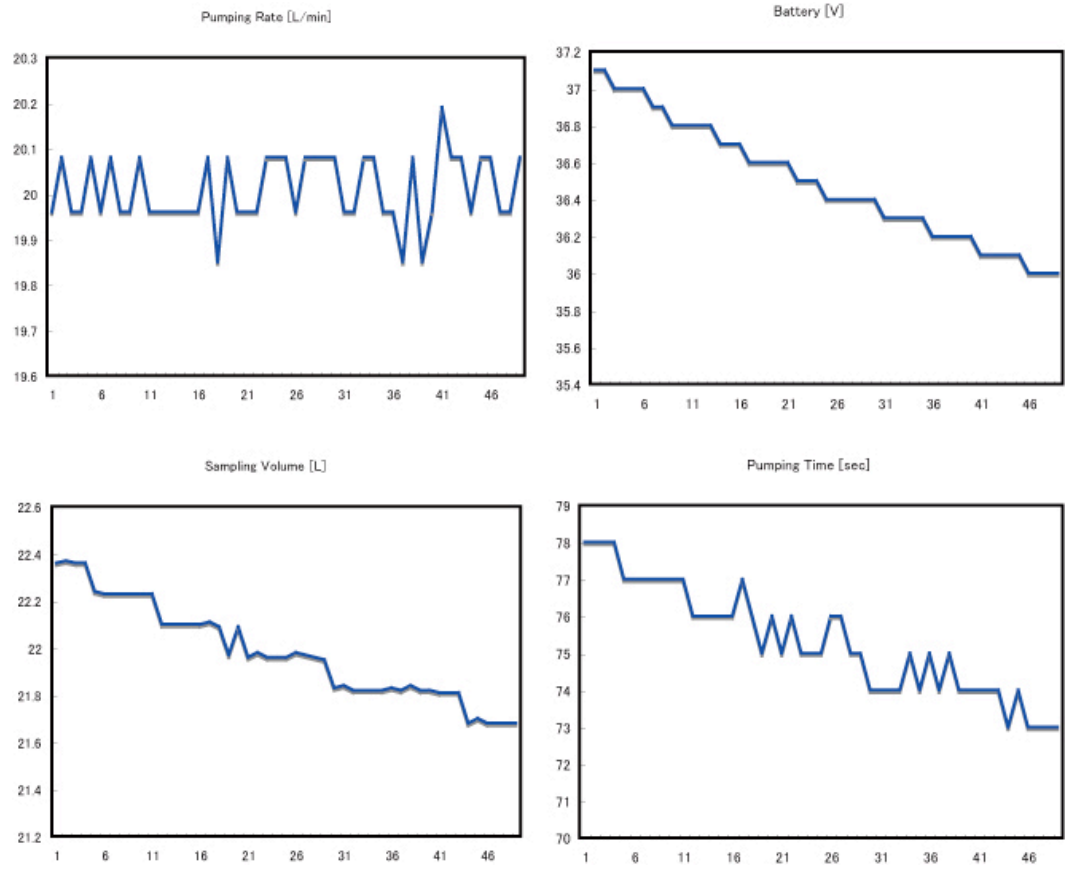


図 6　ADCP で得られた第 1 層目と第 30 層目の流れの周期解析（FFT）

図 6 は，ADCP で得られた第 1 層目と第 30 層目の流速の南北成分と東西成分の周期解析を行った結果である。両観測層共に，半日周期よりやや短い周期と 6 時間付近に変動周期のピークが見られた。初島沖観測ステーションの ADCP の結果や鳩間海丘などで得られた ADCP の測流結果では，潮汐周期に対応した半日周期にピークが見られるが，それと比較すると今回得られた周期のピークはやや短かった。この原因については，まだ明らかになっていない。

（2– 5）本航海中，動物プランクトンサンプラー（ZPS）にてシロウリガイ類群集直上のプランクトン採集を実施した．ZPS の作動状況は，図に示した．ZPS は設定のとおりに作動していたことを確認することができた．一方，ポンプの作動時間および濾水量は，時間（恐らくバッテリー残量）とともに減少していた．採集されたサンプルを下船後検鏡し，シロウリガイ類の卵および幼生分布の時間変動を明らかすることを試みる．



（3）シロウリガイ類成熟サイズの解明

シロウリガイおよびシマイシロウリガイの殻長 10 -70 mm 以下の個体を 10 個体以上採集でき，生殖巣組織切片用に固定試料を作成できた．また，軟体部の一部を種判別遺伝子解析用に確保できた．結果は，今後の解析を待つ．

（4）シロウリガイ類の分布特性

（4– 1）初島沖の水深 800-900 m サイトと 1100 m サイト，沖ノ山堆のシロウリガイ類の種組成（乗船中の解析）

初島沖 800– 900mサイト：19 個体解析したうち 19 個体がシマイシロウリガイ，0 個体がシロウリガイで，シマイシロウリガイ：シロウリガイ＝19:0 となった．

初島沖 1100mサイト：24 個体解析したうち 4 個体がシマイシロウリガイ，20 個体がシロウリガイで，シマイシロウリガイ：シロウリガイ＝1:5 となった．

沖ノ山堆サイト：15 個体解析したうち 3 個体がシマイシロウリガイ，12 個体がシロウリガイで，シマイシロウリガイ：シロウリガイ＝1:4 となった．

（4– 2）初島沖の水深 800-900 m サイトと 1100 m サイト，沖ノ山堆のシロウリガイ類の性比構成

・初島沖 800– 900mサイト：82 個体解析したうち 38 個体がメス，44 個体がオスで，メス：オス＝19:22 となった．性比は，ほぼ 1:1 となった．

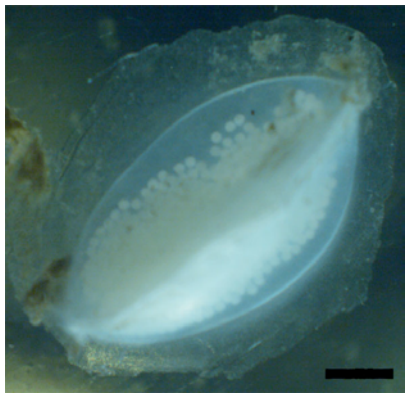
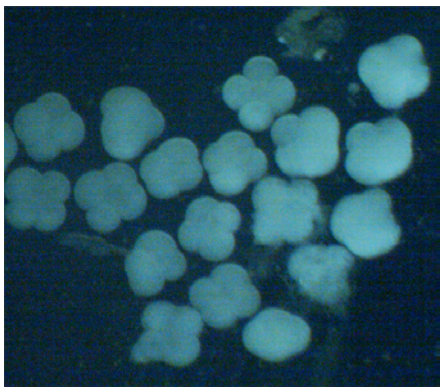
・初島沖 1100mサイト：76 個体解析したうち 37 個体がメス，39 個体がオスで，メス：オス＝37:39 と

なった．性比は，ほぼ 1:1 となった．
・沖ノ山堆サイト：52 個体解析したうち 28 個体がメス，24 個体がオスで，メス：オス＝7:6 となった．性比は，ほぼ 1:1 となった．

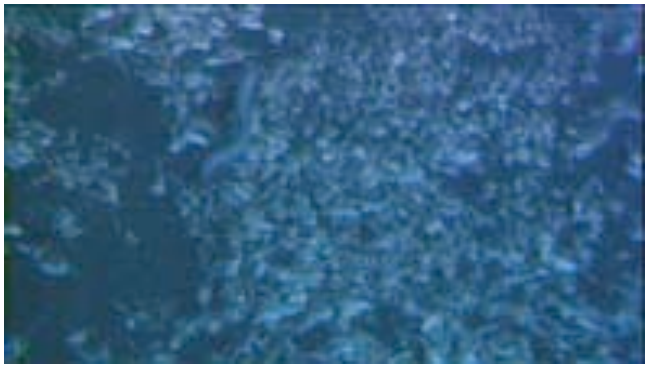
（5）シロウリガイ類の交雑防止メカニズムの解明
（5– 1）シロウリガイ 4 個体分（メス 2 個体，オス 2 個体），シマイシロウリガイ 4 個体分（メス 1 個体，オス 3 個体）の配偶子サンプルを採集し固定処理ができた．結果は，今後の解析を待つ．これにより両種の配偶子の形態やサイズが比較でき，交雑防止メカニズムの解明の一端を明らかにできると期待できる 3.3. Symbiosis: Characterization of Calyptogena gamete を参照．

（6）シロウリガイ類の成長速度の推定
予定通りシロウリガイ類にマーキング液を注入したボックスでおおいをした．これらは 2010 年 1 月のクルーズで回収したのち解析に供される．

（7）ツブナリシャジクの初期生活史の解明
本航海で採集した 12 個体のシンカイヒバリガイ類（ヘイトウシンカイヒバリガイ 11 個体，シンカイヒバリガイ 1 個体．下船後，DNA 塩基配列等で詳細な種の同定を行う）の殻表面から計 274 個の卵カプセルを採集することができた．うち 54 個の卵カプセルは，内容物が確認できなかった．カプセルは，基盤から剥がした後，マイクロプレートにて個別飼育を行っている．10℃で飼育したカプセルからは，幼生の孵出が確認できた．飼育は，下船後も継続する予定である．固定標本を用いた観察結果と合わせて，ツブナリシャジクの発生および幼生の生態学的特徴を明らかにする予定である．

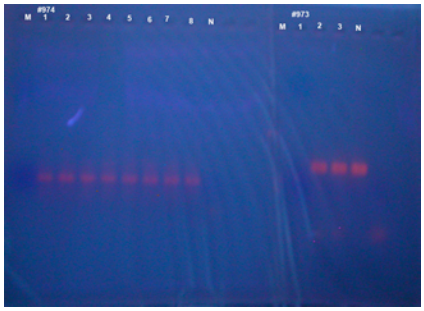
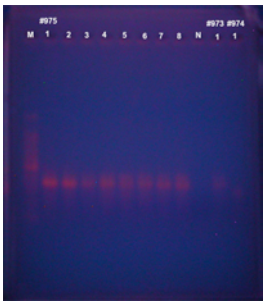
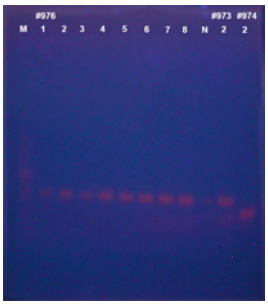
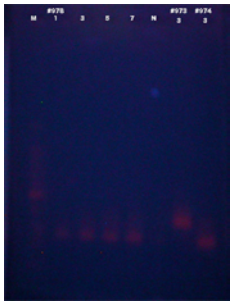
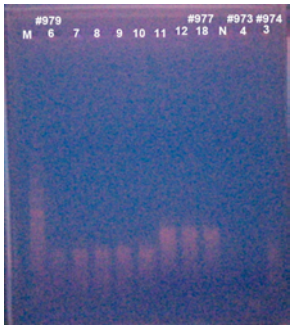
（8）サガミマンジガイの初期生活史と成熟サイズの解明
（8– 1）サガミマンジガイの初期生活史：　サガミマンジガイ成貝から，21 個の卵カプセルを採集することができた．うち，14 個は内容物を確認できなかった．一方，ポテトチップスの外袋には数百個の卵カプセルが付着しており，船上で確認できたカプセルの半分以上に卵が正常と推測される状態で収まっていた．カプセルの一部は，基盤から剥がした後，マイクロプレートにて個別飼育を行っている．乗船中に幼生の孵出は確認することができなかった．飼育は，下船後も継続する予定である．固定標本を用いた観察結果と合わせて，サガミマンジガイの発生および幼生の生態学的特徴を明らかにする予定である．
（8– 2）サガミマンジガイの成熟サイズ：初島沖 1100 m サイト長期観測ステーションの西方約 10m にある変色域に，密集するサガミマンジガイを採集した．これらのうちから大小様々なサイズをブアン固定後，70%エタノールで保存した．今後，ラボで生殖腺の組織切片を作成し成熟サイズや性比の解析に用いる．

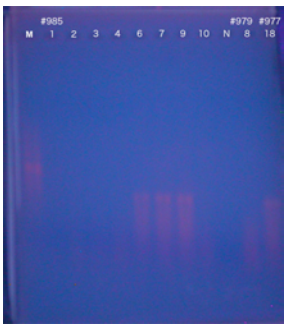



（9）ヘイトウシンカイヒバリガイの成熟サイズの解明
初島沖 800-900 m および 1100m サイトから採集した個体，大小様々なサイズブアン固定後，70%エタノールで保存した．今後，ラボで生殖腺の組織切片を作成し成熟サイズや性比の解析に用いる．

（１０）化学合成生態系—光合成生態系の連鎖構造の解明
食物連鎖および栄養段階を評価するためのサンプルは採集でき，冷凍保管した．結果は，今後の解析を待つ．これにより化学合成生態系—光合成生態系の連鎖構造の一端を明らかにできると期待できる．

（１１）シロウリガイとシマイシロウリガイの短時間種判別方法の確立
種判別マーカーを利用した PCR 産物の電気泳動結果を示した．種判別マーカーは，シロウリガイの場合長い DNA 断片が，シマイシロウリガイの場合短い DNA 断片が増幅されるように設計した．本航海中に実施した種判別では，染色に問題があった場合をのぞき，全てシロウリガイかシマイシロウリガイかを判別することができた．下船後は，一部の個体の DNA 塩基配列情報を取得し，種判別の正確性を確認するとともに，シロウリガイ類の棲み分けについての情報を提供する．




（１２）シロウリガイ類寄生性コペポーダの形態および飼育
シロウリガイ類のエラからサンプルを採集し，10%フォルマリン，エタノール，—80℃冷凍で固定した．成体が保有する２つの卵塊には，各２個ずつ卵が認められた．卵を 10℃と５℃のインキュベータで飼育したところ，5℃でのみノープリウス幼生が孵化した，また，４℃で保管していた冷蔵サンプルからも幼生を確認できた。5℃で飼育している親個体は宿主なしで２日生存している。今後さらに飼育を続け、成長を見たい。

（１３）ハナシガイ類成熟サイズの解明
ハナシガイ科の殻長 25mm の個体を 1 個体採集でき, 生殖巣組織切片用および FISH 用に固定試料を作成できた．また，軟体部の一部を種判別遺伝子解析用に確保できた．結果は，今後の解析を待つ.

3.2. Population

3.2.1. Purpose

An absolute method to morphologically identify Calyptogena soyoae and C. okutanii is not established yet. Currently these two species are identified using michocondrial DNA sequence. C. soyoae has generally higher shell height than C. okutanii. However, some individuals have intermediate shell height, which suggests existence of hybrid species. This study purposes to find hybrid species by genetic analysis. Further, about Bathymodiolus platifrons, Miyazaki et al. (2004) and Fujita et al. (2006) found already from mitochondrial cytochrome oxdase-1 and NADH dehydrogenase-4 sequence analysis a gene flow between Hatsushima Island seep site and Hatoma Knoll. This study also purposes to re-confirm it using allozyme analysis or DNA analysis.

3.2.2. Methods

Hybrids

Calyptogena spp. was collected at Hatsushima Island seep site, a depth of 800m and 1,100m respectively, and Okinoyama Bank, a depth of 1,100m. It is quite difficult to identify two species by morphological character. Dr. Watanabe extracted genomic DNA from mantle lobes of some collected samples immediately at a laboratory of research vessel. Then, maternal species identification was conducted using multiplex PCR of mitochondrial DNA to find rough species composition. The other samples are planned to bring back to Imai’ s laboratory in Okinawa. For the samples stocked in a laboratory of the vessel, adductor muscle was cut and mid-gad organ (including gonad） and muscle tissue (foot) were removed for allozyme analysis with a scalpel. These samples are kept in a deep freezer on the laboratory of research vessel. Also mantle lobe was removed for nuclear DNA analysis. With the result of species identification, all samples are brought back to Imai’ s laboratory and analyzed.

Population genetics

In order to clarify the degree of genetic diversity and gene flow of B. platifrons by DNA or allozyme analysis, we collected fifty individuals at Hatsushima Island seep site and added to the fifty collected through the past research at Hatoma Knoll. The samples will be brought back to Imai’ s laboratory in Okinawa. For the samples stocked in a laboratory of the vessel, adductor muscle was cut and mid-gad organ and muscle tissue (foot) were removed with a scalpel for allozyme analysis. In addition, gonads were removed for sex identification of shell morphology study. These samples, except for gonad samples, are kept in a deep freezer on the laboratory of research vessel. Also mantle lobe was removed for DNA analysis.

3.2.3. Results (including expected)

Hybrids

Table 1 shows sampling localities, total number of individuals, and the result of multiplex PCR conducted to analyze maternal species identification. Among 161 Calyptogena spp. collected at the sampling site of HPD#973～#985, twenty-two individuals were C. okutanii, twenty four were C. soyoae, and one hundred fifteen were not specified. As Table 1 shows, C. okutanii was distributed at the depth of 800m. C. soyoae was dominant at the depth of 1,100m, while some C.

okutanii were also found.

Table 1. Sampling localities, total number of individuals and results of maternal species identification by multiplex PCR.

Species		#973	#974	#975	#976	#977	#978	#979	#985
Depth (m)	854	1,178	855	803	854	1,171	1,176	1,110	
C. soyoae	0	8	0	-	0	4	5	5	
C. okutanii	3	0	8	-	8	0	2	3	
no identify	8	20	14	12	9	3	24	22	
Total no.	11	28	25	12	17	7	31	30	

Population genetics

From 52 individuals collected from HPD#975, HPD#977 and HPD#980, mid-gad grand and muscle tissue (foot) were removed for allozyme analysis (Table 2). These samples were kept in a deep freezer, and mantle lobe was removed for DNA analysis. All the shells were brought back to our laboratory for measurement.

Table 2. Sampling localities and total number of individuals, Bathymodiolus platifrons

Species	#975	#977	#980	total
B. platifrons	11	4	37	52
B. japonicus	6	8	0	14
Total no.	17	12	37	66

3.3. Symbiosis: Characterization of Calyptogena gamete

3.3.1. Purpose

シロウリガイ類のエラ細胞内には化学合成細菌が共生している。共生菌は主に硫化水素などを酸化することでエネルギーを獲得し、植物のように二酸化炭素を固定し有機物を合成している。シロウリガイ類の口や消化管は退化的であることから、自らの栄養のほとんど全てを共生者である化学合成細菌に依存して生育していると思われる。シロウリガイ類の共生菌は、卵を介して次世代に垂直的に伝播し、系統解析からも宿主と共生者が共進化していると考えられる。

初島沖には、形態からの判別が難しいが、遺伝的には異なるシロウリガイとシマイシロウリガイの 2 種類が生息している。これらの 2 種類の違いを調べるために、卵と精子の比重や卵や卵巣における共生細菌の分布について解析した。

3.3.2. Methods

サンプルには、Table 1 の個体を用いた。各個体は、解剖後、生殖巣を切り出し、ろ過海水に入れて、組織から出てくる精子や卵子をパーコールによる密度測定を行った（Fig 1 .参照）。また、現場放精放卵実験で得られた卵や、解剖で得られた卵や卵巣、精巣における共生細菌の分布解析用に、光学顕微鏡用（4%パラフォルムアルデヒド）、電子顕微鏡用（2.5%グルタルアルデヒド，2.5%グルタルアルデヒドー4%パラフォルムアルデヒド）の固定及び DNA 解析用の凍結を行った。

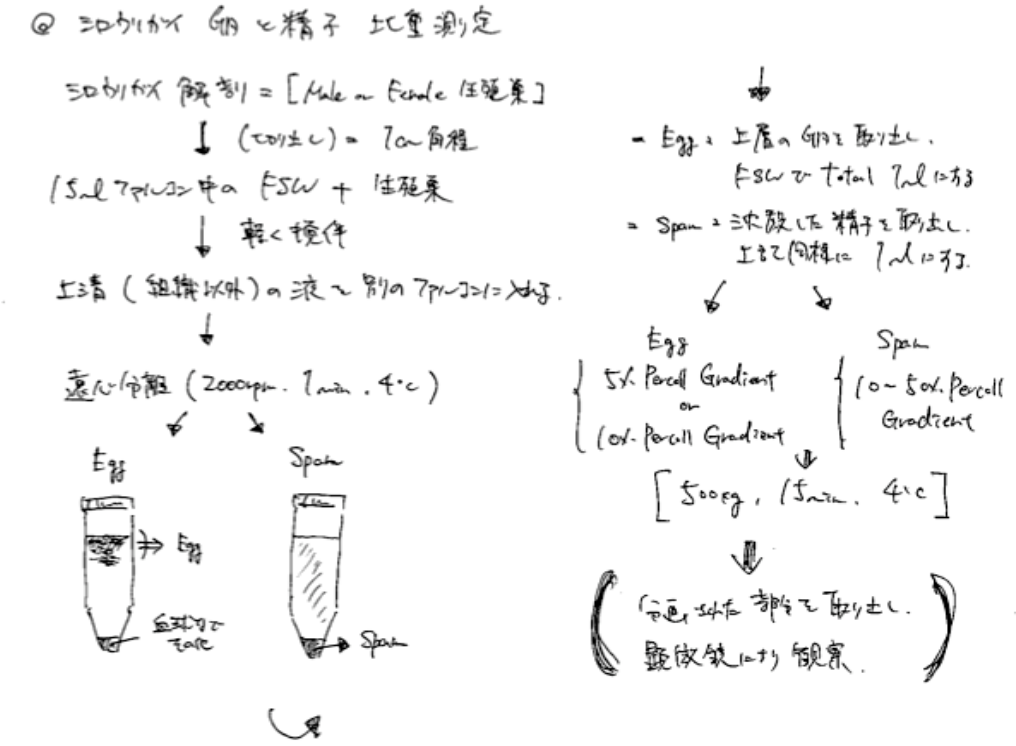


Fig. 1.シロウリガイ卵・精子 密度測定プロトコール

Table 1. 用いたサンプル

On board No.	Species Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	Remarks	固定部位	凍結部位
HD976S01-01	Calyptogena okutanii	Watanabe	Off Hatsushima Is.	Sagami-Bay	803	35	00-935	N	139	13-222	E	2009.4.27	male	精巣、精子	残り全て
HD976S01-02	Calyptogena okutanii	Watanabe	Off Hatsushima Is.	Sagami-Bay	803	35	00-935	N	139	13-222	E	2009.4.27	female	卵巣、卵	残り全て
HD976S01-03	Calyptogena okutanii	Watanabe	Off Hatsushima Is.	Sagami-Bay	803	35	00-935	N	139	13-222	E	2009.4.27	femal	卵巣、卵	残り全て
HD977S01-01	Calyptogena okutanii	Watanabe	Off Hatsushima Is.	Sagami-Bay	854	35	00-944	N	139	13-305	E	2009.4.27	male	精巣、精子	残り全て
HD977S01-06	Calyptogena okutanii	Watanabe	Off Hatsushima Is.	Sagami-Bay	854	35	00-944	N	139	13-305	E	2009.4.27	male	精巣、精子	残り全て
HD978S01-01	Calyptogena soyoae	Watanabe	Off Hatsushima Is.	Sagami-Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	female	卵巣、卵	残り全て
HD978S01-03	Calyptogena soyoae	Watanabe	Off Hatsushima Is.	Sagami-Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	male	精巣、精子	残り全て
HD978S01-05	Calyptogena soyoae	Watanabe	Off Hatsushima Is.	Sagami-Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	male	精巣、精子	残り全て
HD979S01-01	Calyptogena okutanii / soyoae	Fujikura	Off Hatsushima Is.	Sagami-bay	1176	35	00-092	N	139	13-516	E	2009.4.28	female	卵巣、卵	残り全て
HD981S08	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	857	35	00-961	N	139	13-334	E	2009.4.29	male	精巣	エラ、精巣、残り全て
HD981S09	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	857	35	00-961	N	139	13-334	E	2009.4.29	male	精巣	エラ、精巣、残り全て
HD981S10	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	857	35	00-961	N	139	13-334	E	2009.4.29	female	卵巣	エラ、卵巣、残り全て
HD981S11	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	857	35	00-961	N	139	13-334	E	2009.4.29	male	精巣	エラ、精巣、残り全て
HD981S12	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	857	35	00-961	N	139	13-334	E	2009.4.29	female	卵巣	エラ、卵巣、残り全て
HD986_Bag#2	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2		卵	卵
HD986B01	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2	female	なし	エラ、卵巣、残り全て
HD986B02	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2	female	卵巣	エラ、卵巣、残り全て
HD986B03	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2	female	なし	全身
HD986B04	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2	female	なし	全身
HD986B05	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2	female	なし	全身
HD986B06	Calyptogena okutanii / soyoae	Fujikura	Okinoyama Bank	Sagami-bay	1103	34	58-374	N	139	31-541	E	2009.5.2	male	精巣	エラ、精巣、残り全て

3.3.3. Results (expected)

シマイシロウリガイの卵及び精子の密度測定を行ったところ、卵は海水よりも軽く、精子は海水よりも比重は大きかった（Fig. 2)。また、シロウリガイの卵及び精子も同様に測定し、同じ様な結果であった(Fig 2)。今後は得られたデータを細かく解析するとともに、固定サンプルを用いて形態及び DNA 解析を行い、２種のシロウリガイ類の卵及び精子にどのような違いがあるかを調べていく。また、卵や卵巣、精巣における共

生細菌の定量と分布を解析する。

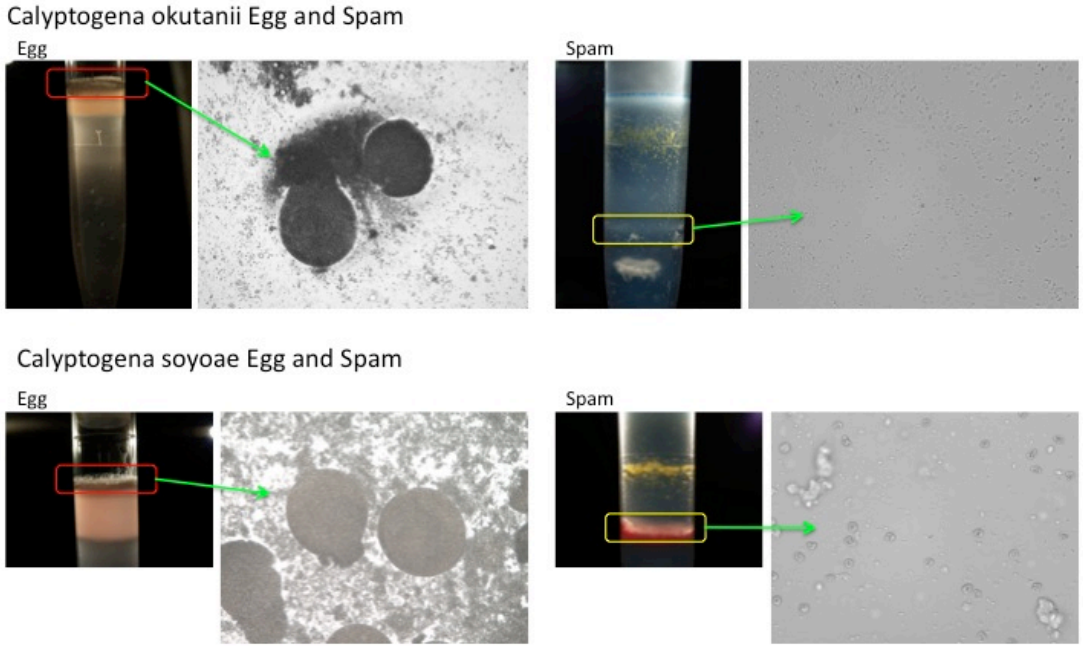


Fig.2 パーコール実験結果上）シロウリガイの卵・精子, 下）シマイシロウリガイの卵・精子.

3.4. Blood cell function: Morphological characterization of the immunological responses of hemocytes, Calyptogena sp.

3.4.1. Purpose

深海の化学合成生態系では、化学合成共生細菌と宿主の無脊椎動物との間に共生関係が構築されていることが知られている。このような共生系を構成するシロウリガイ類にどのような生体防御機構があるか、また共生細菌と外来微生物では防御反応にどのような違いがあるかについては未だに明らかにされていない。そのため、まず生体防御に重要な役割を持つと思われる血球細胞を形態学的な手法によりその種類や免疫反応を観察し、生体防御における働きを明らかにする。また、シロウリガイ類に関しては飼育が困難で、実験室で長生きしない事から、船上での実験によりシロウリガイ類の基礎的な免疫作用を明らかにする事を試みた。

3.4.2. Methods & Results (expected)

シロウリガイの貝柱から血液を採取し、Percoll を用いた密度勾配遠心分離により血球の種類の分離を試みた。また、蛍光標識した大腸菌を加えて、蛍光顕微鏡により貪食反応の有無を観察した。

その結果、シロウリガイ血球細胞は密度勾配により上層部（低密度＝軽い）に２種類の血球細胞、下層部（高密度＝重い）に赤血球が見られた。またそれぞれの血球細胞の貪食反応を観察したところ、上層に分離された細胞の内、その底部に分離された細胞に反応が多く見られるようである。しかし未だ不明確であるため、今後も研究を継続する必要がある。

本研究に用いるための固定サンプル作成は十分にできたため、今後は実験室で固定した血球細胞の詳細な観察を行う。

3.5. Foraminifera

3.5.1. Purpose

Akimoto et al. (1994) have already investigated foraminiferal assemblages (Rose-Bengal stained

and dead foraminifera) from different cold seeps in eastern and western Sagami Bay. They studied the uppermost sediment. Bulimina striata, Rutherfordoides cornuta and Bulimina aculeata were predominant species at all stations without any preference for seep or non-seep environments. However, Bulimina striata and Rutherfordoides cornuta were more abundant in Calyptogena colonies off Hatsushima. Bulimina aculeata and Chilostomella ovoidea thrived preferentially in fine sediments away from vesicomyid colonies. Kitazato (1996) mentioned that both benthic foraminiferal species associated with cold seepage from Sagami Bay (Rutherfordoides cornuta and Bulimina striata) were not endemic and could be found in oxic bottom or in anoxic micro-environments below the surface oxic layer. He proposed that to survive in anoxic/euxinic cold seep, foraminifera may use anaerobic respiration system or may be in symbiosis with sulfide oxidizing bacteria. In a preliminary JSPS report (2009), we (Fontanier C., Tsuchiya M., Nomaki H., Toyofuku T., Kitazato, H.) have investigated live (Rose-Bengal stained) and dead benthic foraminifera collected in a cold-seep area off Hatsushima Island (Sagami Bay, central Japan) (Cruise NT06-04, March 2006). We focused on the topmost sediment of two cores sampled at different sites located at the similar depths (~1200 m). The first core was collected in a Calyptogena field (named the South Colony Area). The second one was collected in non-seep site, ~100 m away from the South Colony Area. Surprisingly, no living foraminifera and only few dead foraminifera were found in the uppermost sediment from this Calyptogena site. Such a foraminiferal desert may echo a recent benthic storm related to complex hydrosedimentary processes prevailing at this site. The foraminiferal assemblage from the non-seep area was characterized by only agglutinated taxa. Living fauna was poorly diverse and presents low standing stock, suggesting unfavorable conditions prevailing at this site. The presence of acidic pore water (pH of 7.45-7.60) (Tsuchiya M., Unpublished data) in the topmost sediment may explain the absence of calcareous species. We did not find the commonly described species from seep areas. Finally, a strong spatial variability of foraminiferal fauna was recorded between both sites. Moreover, it seems that foraminiferal temporal dynamics is also constrained by hazardous benthic events. In the present study, we want to document precisely living foraminiferal communities from different seep areas in Sagami Bay in order to complete previous observations. Our work is divided in 3 parts. The first part of our investigation is to describe the community structure (density, diversity and microhabitat) in the topmost sediment collected from different areas. More precisely, we want to focus on foraminifera living in Calyptogena colonies, in bacterial mats and in non-seep sites close to clam fields. As a second step, we want to collect living foraminifera for cytological studies (TEM). We want to investigate the location of organella in foraminifera species which are distributed from dysoxic to euxinic microenvironment. As a third goal, we want to collect living material for foraminiferal culture experiments. The living specimens will be employed in experiments with several pH conditions (from normal (~8.2) to sever (7.0)). Those experiments will be realized at the JAMSTEC culture laboratory. Finally, we attempt some biogeochemical measurement on foraminiferal cell on board to investigate metabolism of Chilostomella ovoidea what has mysterious ecology.

3.5.2. Methods

We collected sediment cores with MBARI Plexiglas tube (internal diameter: 7.0 cm) from different sites (seep areas, non seep areas). For culture, TEM investigation and Rose-Bengal staining, the sediment cores were vertically subsampled at 0.5 cm intervals down to 2 cm, and 1 cm intervals from 2 to 5 cm depth. For culture material and cytological investigation, each of these layers was preserved at a temperature of ~5°C in the cold room before extraction of foraminifera. Some living foraminifera were sorted aboard the ship. Concerning Rose-Bengal stained foraminifera, sediment slices were stored in plastic pots with a solution of 0.1%

Rose-Bengal 20% ethanol-seawater. Some surface samples were washed and sieved with nested 32 μm, 63 μm and 150 μm mesh sieves. Some living (stained) foraminifera were picked aboard the ship under binocular microscope. In some cases when logistical problem occurred during core sampling, we only kept bulk sediment. We also fixed some sediment core with Formalin solution. In such case, we vertically subsampled at 0.5 cm intervals down to 4 cm, and 1 cm intervals from 4 cm depth to the lowermost part of the sediment.

3.5.3. Expected result

With several samplings in different environments (Calyptogena colony, bacterial mats, non-seep environs), we hope to observe important spatial variability characterizing the benthic foraminiferal faunas living at the deep-sea floor. We expect to observe ecological zonation as it is commonly recorded for metazoans in seepage area. However, we may also record in some places the imprint of hydrosedimentary processes prevailing at the sediment-water interface. For instance, the core collected at the South Colony Area in 2006 (NT06-04) was characterized by coarse sediment (predominantly sand-size class) with some glauconitic inner moulds of planktonic foraminifera. No living benthic foraminifera were found. Such sedimentary features may be related (1) to the deposition of reworked material coming from shallower depth, (2) active winnowing by strong bottom currents or (3) casual winnowing by seepage. On the other hand, the distribution of organelle among species will be shown by TEM observation. It may be reflected living environment of species.

3.5.4. Preliminary Results about Foraminiferal Assemblage

#973

Description of the sieve residues (>150 μm) from the 0-0.5 cm interval (dive 973, " Blue-red" core):

The sediment is heterometric with many angulous or xenomorphous sand-sized particles. Most large particles look like tephra. Only rare dead planktonic foraminifera are observed. Benthic foraminifera (dead and living) present low abundance.

Concerning foraminiferal living community, we could identify 10 foraminiferal taxa (+ undetermined agglutinated and soft shelled foraminifera) (Table 1). We counted 40 living (stained) individuals. The dominant species were Chilostomella ovoidea and Bulimina striata (50% of the total standing stock). A lot of Chilostomella ovoidea presented a doubtful staining. We did not consider them as " living".

Core Blue-red, Dive #973 0-0.5 cm interval, size fraction >150 μm	Living (Rose-Bengal stained) fauna Absolute density	%
Calcareous species		
Bulimina aculeata	1	2.5
Bulimina striata	8	20.0
Bulimina sp.1	1	2.5
Chilostomella ovoidea	12	30.0
Globobulimina pacifica	1	2.5
Nonion sp.1	4	10.0
Uvigerina akitaensis	1	2.5

Agglutinated species		
Indet.	1	2.5
Hipocrepinella alba	2	5.0
Labrospira wiesneri	1	2.5
Lagenammina pseudodifflugiformis	1	2.5
Reophax dentaliniformis	1	2.5
Reophax scopiurus	1	2.5
Reophax cf. scorpiurus	1	2.5
Reophax subfusiformis	1	2.5
Reophax sp.1	1	2.5
Soft-shelled foraminifera	2	5
Total Taxa number	40 12	100

Table 1 Living (stained) foraminiferal faunas in Blue-red core (Dive 973)

#974

Description of the sieve residues (>150 µm and 63-150 µm) from the bulk sediment (dive 974, core Black):

Because the sediment was too fluid, we were not successful to subsample the core. We could only collect bulk sediment. It was smelling hydrogen sulfide. In a second core (red core) dedicated to bacterial study, we could observe thin orange filaments (putative sulfur-oxidizing bacteria?) covering the sediment-water interface.

The preliminary observation of the sieve residues of the bulk sediment collected at the bacterial mat (dive 974, core black) did not reveal any living foraminifera. In the >150 µm size fraction, we observed only dead specimen of Rutherfordoides spp. (dominant), Chilostomella ovoidea, Bulimina spp. and Globobulimina spp. In the >63-150 µm size fraction, we found no foraminifera.

Further investigations of sampled sediment are probably required to precise the foraminiferal community at this site. Moreover, a correctly sub-sampled core is necessary to really appreciate the putative foraminiferal fauna living at the sediment-water interface in the sub-millimetric bacterial mat.

#978

Description of the sieve residues (>150 µm and 63-150 µm) from the 0-1 cm interval (dive 978, " Blue" core):

A partial observation (~50% of the sample) of the >150 µm size fraction in the "Blue" core (0-1 cm, dive #978) revealed few living foraminifera (1 Stainforthia cornuta and 1 Bulimina aculeata) and really few dead ones.

The smaller size fractions (32-63 µm; 63-150 µm) may be richer. – Further investigations of sampled intervals (deeper layers and all size fractions) are required to precise the foraminiferal structure at this site.

#981

Description of the sieve residues (>150 μm) from the 0-0.5 cm interval (dive 981, " Blue" core):

This core was collected at ~50 m away from " Red-Blue" core (dive 973). This core is located very close to a Calyptogena colony (less than 5 m).

The sediment is heterometric with many angulous or xenomorphous sand-sized particles. Most large particles are scoria. Benthic foraminifera (dead and living) are present in moderate abundance.

Concerning foraminiferal living community, we could identify 21 foraminiferal taxa (+soft shelled foraminifera) (Table 2). We counted 182 living (stained) individuals. The dominant species were Reophax dentaliniformis (micaceus?) and Textularia kattegatensis (respectively, 47.8% and 13.7%). Chilostomella ovoidea and Rutherfordoides spp. are also present.

Core Blue, Dive #981 0-0.5 cm interval, size fraction >150 μm	Living (Rose-Bengal stained) fauna Absolute density	 %
Calcareous species		
Alliatina primitiva	1	0.5
Astacolus sp.	2	1.1
Bulimina aculeata	1	0.5
Bulimina striata	2	1.1
Chilostomella ovoidea	12	6.6
Globobulimina sp.1	3	1.6
Globobulimina sp.2	5	2.7
Globobulimina sp.3	5	2.7
Nonionella stella	2	1.1
Pullenia quinqueloba	1	0.5
Rutherfordoides cornuta	10	5.5
Rutherfordoides rotundata	9	4.9
Sphaerodoidina bulloides	1	0.5
Uvigerina akitaensis	2	1.1
Virgulina complanata	1	0.5
Agglutinated species		
Cribrostomoides subglobosus	7	3.8
Leptohalysis gracilis	1	0.5
Reophax dentaliniformis (micaceus?)	87	47.8
Reophax scopiurus	1	0.5
Reophax sp.2	1	0.5
Textularia kattegatensis	25	13.7
Soft-shelled foraminifera	3	1.6
Total Taxa number	182 21	100

Table 2 Living (stained) foraminiferal faunas in Blue-red core (Dive 973)

The high abundance of agglutinated species is not in agreement with observations by Akimoto et al. (1994). The fauna is also different compared to living foraminifera found 50 away from this site in " non-seep" sediment (dive 973, " Red-Blue" core) (Fig. 1).

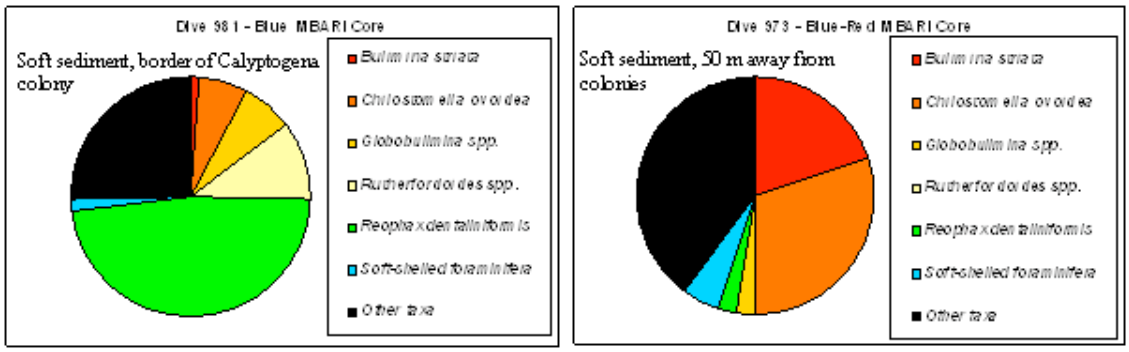


Fig. 1 Camembert of relative abundances of dominant species (>5%) in both cores (Blue core and Blue-Red core) collected during Dives 973 and 981. Both cores are located 50 m apart.

3.5.6 References

Akimoto K., Tanaka T., Hattori M., Hotta H. (1994). Recent benthic foraminiferal assemblages from the cold seep communities - a contribution to the methane gas indicator. In: Tsuchi R. (Ed.), Pacific Neogene Events in Time and Space. University of Tokyo Press, Tokyo, pp.11– 25.

Kitazato H. (1996) Benthic foraminifera associated with cold seepages: Discussion of their faunal characteristics and adaptations. Fossils, 60, 48-52.

3.6. Microbiology

3.6.1. Purpose

To analyze the microbial community of sea-floor organisms at Sagami Bay

3.6.2. Methods

1, Sampling of two types sediments (S1-2)

S-1 ; Orange-color biomat (Off Hatsushima Is., depth 1170 m, 35-00.174N, 139-13.479E.)

S-2 ; Sediment inside the Pannychia moseleyi intestine (Okinoyama Bank, depth 1124 m, 34-58.353N, 139-31.465E.).

2, S-1 sediment was cut (0-2 including orange patch, 2-5 green black sediment. Light green gray clay in the Shell.)

3, Direct extraction of DNA and total RNA from the sediments (expected)

4, For DNA; Amprification of 16S rDNA by PCR method (expected)

For RNA; RT-PCR (16S rRNA, mRNA) after DNase treatment (expected)

5, Phylogenetic analysis (expected).

3.6.3. Results (expected)

1. S-1 contains orange-green fiver and high H_2S (measured by Oguri), and S-2 is viscous silky silt.

2. It is thought that bacteria are concentrated in the biomat and inside the deposit feeder Pannychia moseleyi intestine. Gene expression pattern based on the mRNA analysis will clarify the adaptative mechanism of deep-sea environment. In addition, bacteria which are useful for industrialization might be isolated (expected).

3.7. Diversity

3.7.1. Purpose

・湧水生物群集における Fungi の多様性は，ほとんど未着手であるため，その多様性を解析する

・還元的環境，多毛類体表，海洋表層水からは，例えば既知のスーパーグループなどに含まれない生物群が見いだされる．それらは真核生物の初期進化解明に貴重な情報を与えることが期待できる．そこで，湧水生

物群集における原生生物の多様性を解析する.
・湧水生物群集のマクロ，メガベントスの多様性を知る.

3.7.2. Methods

・湧水生物群集構成種のうち数種を 4℃で保管し，体表などに付着する Fungi の多様性を解析する.
・初島沖湧水群集の堆積物を 50cc ファルコンチューブに空気が入らないようにして密閉, 4℃保管（＃989）. 冷蔵便でダルハウジ大学の瀧下と共同研究者へ送付.
・初島沖湧水群集の Alysia sp.を 70%エタノールおよび 10%海水フォルマリンにて固定．冷蔵便でダルハウジ大学の瀧下と共同研究者へ送付.
・2009 年 5 月 5 日に初島沖鯨骨サイトの表層水をバケツでくみ，密閉ボトルに入れ 20-25℃の室温保管. 5 月 6 日に環境研河地氏へ引き渡し.
・湧水生物群集から未記載種，同定できない種を採集し，70%エタノールおよび 10%海水フォルマリンにて固定．国内外の専門分類学者と共同で分類学研究を進める.

3.7.3. Results (expected)

いずれのサンプルも今後の解析結果待ちである.

3.8. Morphological characterization of the immunological responses of hemocytes, Calyptogena sp.

3.8.1. Purpose

深海の化学合成生態系では、化学合成共生細菌と宿主の無脊椎動物との間に共生関係が構築されていることが知られている。このような共生系を構成するシロウリガイ類にどのような生体防御機構があるか、また共生細菌と外来微生物では防御反応にどのような違いがあるかについては未だに明らかにされていない。そのため、まず生体防御に重要な役割を持つと思われる血球細胞を形態学的な手法によりその種類や免疫反応を観察し、生体防御における働きを明らかにする。また、シロウリガイ類に関しては飼育が困難で、実験室で長生きしない事から、船上での実験によりシロウリガイ類の基礎的な免疫作用を明らかにする事を試みた。

3.8.2. Methods & Results (expected)

シロウリガイの貝柱から血液を採取し、Percoll を用いた密度勾配遠心分離により血球の種類の分離を試みた。また、蛍光標識した大腸菌を加えて、蛍光顕微鏡により貪食反応の有無を観察した。

その結果、シロウリガイ血球細胞は密度勾配により上層部（低密度＝軽い）に２種類の血球細胞、下層部（高密度＝重い）に赤血球が見られた。またそれぞれの血球細胞の貪食反応を観察したところ、上層に分離された細胞の内、その底部に分離された細胞に反応が多く見られるようである。しかし未だ不明確であるため、今後も研究を継続する必要がある。

本研究に用いるための固定サンプル作成は十分にできたため、今後は実験室で固定した血球細胞の詳細な観察を行う。

3.9 Environmental measurements

3.9.1 Purpose

Two Calyptogena species, C. soyoae and C. okutanii are found in Hatsushima seep area. To understand spatial distributions of the two different species, chemical properties of the sediments living the clams may provide significant information why they distribute similar environments. H_2S and total S^{2-} profiles were measured using with push cores during the dive in NT09-06 cruise.

3.9.2 Method

H_2S and total S^{2-} measurements

H_2S concentrations in cores were measured using with a H_2S microelectrode in tip diameter of 50 mm and the related equipments (H2S-50 microelectrode, USB-216 A/D converter, MC232 motor controller, MMS-2 micromanipulator, Profix 3.1 data acquisition software, Unisense). Before measurements, the sensor was calibrated based on the manual: (1) the sensor was connected to the picoammeter and left more than 24 hours. (2) the sensor tip was immersed in

the pH=4.01 buffer solution (Wako Chemical Industrial) and waited to stabilize the value. The reading was recorded as a background value. (3) 1 ml of H_2S containing solution (0.2g of $Na_2S \cdot 10H_2O$ was dissolved in 100 ml of distilled water removed O_2 by N_2 bubbling for 5 minutes) was added in the buffer solution. The sensor tip was immersed in the solution, and the value was recorded for the calibration when the value was stabilized. (4) After the record of the value, 0.9 ml of the H_2S solution was collected in 1 ml syringe. The H_2S concentration in the solution was measured by simplified method (Sakai, personal communication) based on Cline (1969). (5) The voltage values from the microelectrode were converted into H_2S concentrations using with the background and the concentration obtained in (4).
The H_2S profiles in the sediments were carried out using with a microelectrode system shown above. The interval of the measurement was every 1 mm. H_2S microelectrode, however, can only measure H_2S partial pressure. In low pH solutions less than 4.0, total S^{2-} concentration is equivalent to the H_2S concentration. However, typical pH values in interstitial water in sediments are estimated around 7.0~8.0. These pH values significantly change the H_2S concentrations. This research, total S^{2-} values in the same sediment samples were calculated to measure pH values based on the equation and the pK_1 values described in the manual by Unisense and Millero et al. (1988), respectively.

pH measurement
pH values in sediments were measured by pH and reference electrodes with pH meter system (PHC2001-8 pH electrode, REF251 reference electrode and PHM220 meter, Radiometer Analytical). Prior to the measurements, pH electrode was calibrated to immerse the pH and the reference into respective standard solutions (pH=7.00 and 10.018, IUPAC). After the two point calibration, the electrodes were inserted into sample sediment cores. pH values were recoded after stabilizing the readings. The interval of the measurement was every 1 cm.

3.9.3. Preliminary results

12 cores were analyzed for H_2S, Total S^{2-} concentrations and pH values, respectively. The results are summarized in Fig. 3-1-1. From the sediments collected at #973-2, #979-1, #982-1, #984-1, #984-2, #990-1 and #990-2, sulfide were not detected or the concentrations were very low. The other cores showed the sulfide production below sediment-water interface, especially below 20 to 50mm from sediment surface. The sample from dive #976-1 indicated very high sulfide concentrations. It indicates that the sulfide distribution at Hatsushima seep area has large spatial fluctuations, suggesting patchy distribution of the sulfate reduction. On the other hand, sulfide could not detect in Okinoyama sediments, even the sediments were collected besides living Calyptogena clams. The reason will be investigated based on sediment composition and the distributions of Caliptogena communities from the video images. Note that the data presented here are tentative. The values may vary in case if any corrections are made after the cruise.

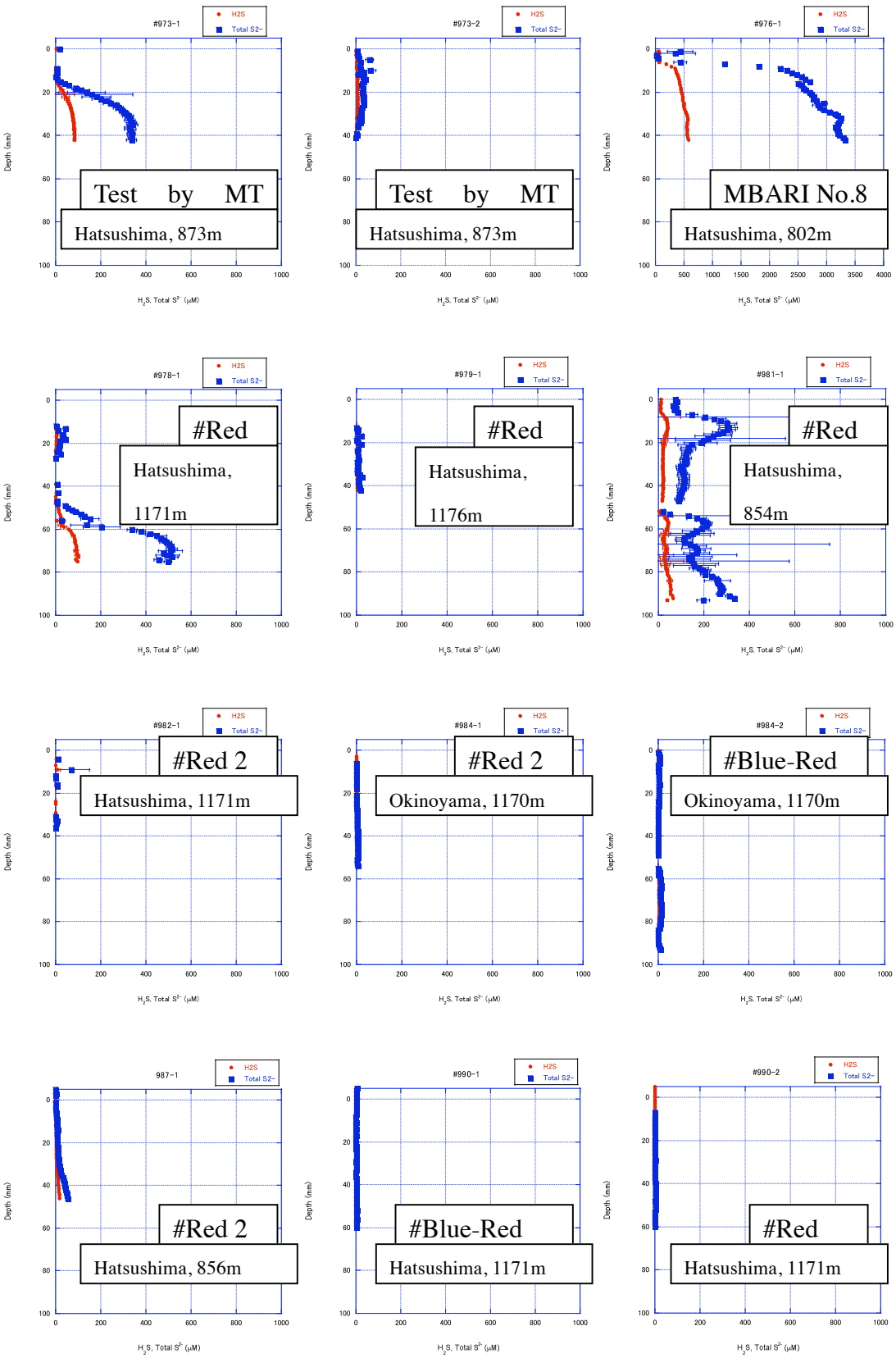


Fig. 3-1-1. H_2S and Total S^{2-} profiles obtained in the sediment samples. Cores from #973-1 to #982-1, #987-1, #990-1 and #990-2 were collected from Hatsushima seep area. #984-1 and #984-2 were from Okinoyama bank.

3.9.4. References

Cline J.D. (1969) Limnol. Oceanogr. 14, 454-458.
Millero et al., (1988) Limnol. Oceanogr. 33, 2, 269-274.

3.10. Long-term environmental monitoring

3.10.1. Purpose

O_2 is one of the most significant elements to understand biogeochemical processes at sediment-water interface (SWI). Organic materials arrived at SWI through the water column are remineralized by aerobic decomposition and O_2 is consumed and a part of them are preserved into sediments. Because organic materials are still abundant in sediment, O_2 distribution below sediment surface is expressed by diffusion (Ramssen and Jorgensen, 1992). However, benthic organism activities make bioturbation and as a consequence, sediment surface is always mixed and remineralization is enhanced. Biological pumping such as polychaeata actively brings O_2 rich water below diffusive O_2 penetration depth in a short time. Such" bioirrigation" is also important remineralization- O_2 consumption processes at SWI. From a long time environmental changes, phytoplankton productions in euphotic zone may influence O_2 consumption and benthic activities. To investigate O_2 dynamics from a point of view on both short and long time fluctuations, long term monitoring in frequent measurement is required. In this research, equipment for two dimensional O_2 monitoring at SWI were deployed and started to measure the profiles.

3.10.2. Methods

Planar O_2 optode technique based on luminescent quenching of O_2 sensitive dye is applied for the two dimensional O_2 measurements (Glud et al., 1996). This method has improved to obtain both grayscale profile images and the concerning O_2 distributions at a same time by luminescence lifetime imaging with a multi gateable CCD camera (Holst and Grunward, 2001). In this study, planar O_2 optode system based on the lifetime imaging for long term monitoring was developed by JAMSTEC. The system consists of a sensor foil embedded O_2 sensitive dye, combination of an excitation light source, a multi gateable CCD camera and a trigger generator, Windows based PC with hard disk drives and general control board. The camera was packed into a titanium cylinder with pressure window, and the sensor foil was attached in front of the window of an inverted periscope attached to the camera cylinder (Fig. 3-10-1). All equipments, a reference O_2 sensor (Optode 3830, Aanderaa Data Instruments) and an acoustic transponder were installed into an ELINOR type lander (Fig. 3-9-2). The total weight of the lander system was ca.350 kg in air and ca. 30 kg in water, respectively.

Prior to dive #983 on 30th/Apr/2009, the lander installed the planar O_2 optode was released on board. During the descending the position of the lander was traced by ship. After 32 minutes from the release, the lander was landed to the bottom which depth of 1200 m. Averaged descending speed was 40 m/min.

After the confirmation of the landing, the dive had started. The ROV first arrived at the landing site, and the lander was hung by ROV and was settled to the undisturbed sea bottom where 70 m southward from Hatsushima permanent station (35-00.153N, 139-13.529E, water depth of 1184 m). After the setting of the lander, the ROV moved to the station. The plug of an extension power cable (L=100 m) was inserted in the power supply connector of the station, and the cable was extended to the lander.

At the same time, electrical insulation of the cable was confirmed at the land station. When cable extension was completed and the other plug was inserted in the connector of the optode system, power was supplied from the land station. Voltage and electric current were measured at the land station. These data were continuously sent to JAMSTEC via internet.

When the power was supplied, a computer of the planar O_2 optode system was started up. First, O_2 concentration in water was measured. Then, camera cylinder was moved downward by

stepping motor rotation. When the sensor was placed on appropriate position (i.e., sediment surface was just placed at the center part of the sensor foil), the elevator motor stopped and the measurement of the two dimensional O_2 profiles were started. The measurement interval in each batch is 1 hour. In each batch, 9 profiles are obtained in 2 minutes interval.

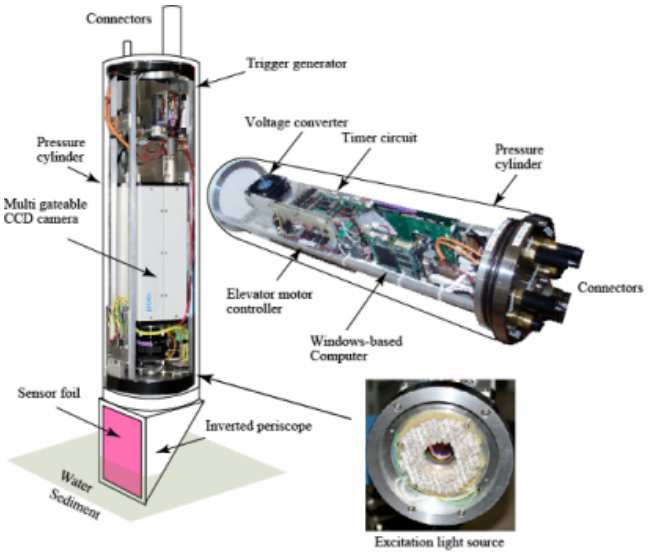


Fig. 3-10-1. The planar O_2 optode system. The system consists of two pressure cylinders: computer and camera cylinders. The camera cylinder has inverted periscope filled with distilled water. The sensor foil is attached in front of the periscope window. The camera cylinder is mounted on an elevator system, and the sensor is placed at SWI by motor rotation.

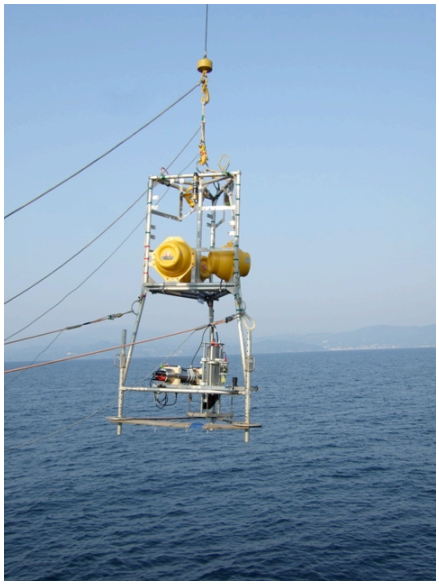


Fig. 2. The Lander system installed the planar O_2 optode system.

3.10.3. References

Glud et al. (1996) Mar. Ecol. Prog. Ser. 140, 217– 226.
Holst and Grunward (2001) Sens. Actuators B. 74 (1– 3), 78-90.
Rammusen and Jorgensen (1992) Mar. Ecol., Prog. Ser. 81, 289– 303.

3.11. DO measurement

3.11.1. Purpose

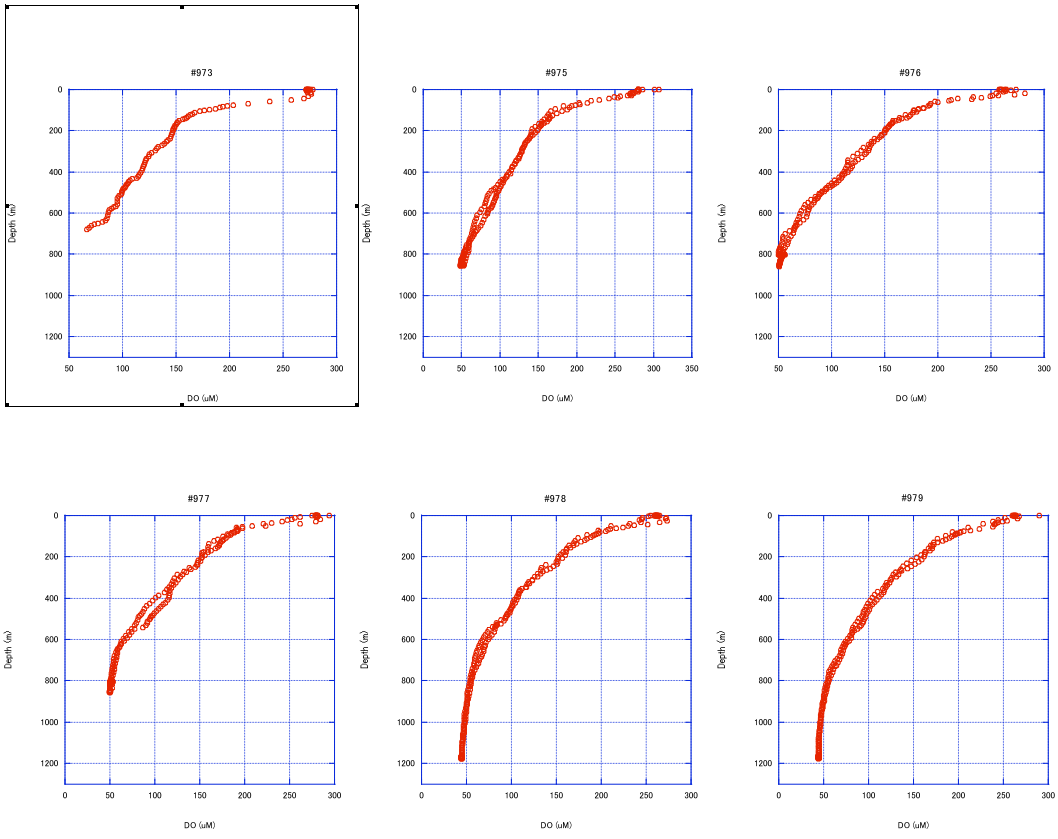
To understand dissolved oxygen (DO) distributions in Sagami bay water column, continuous DO measurements were performed during the dive in NT09-06 cruise.

3.11.2. Methods

Optical DO sensor (Oxygen optode 3830, Aanderaa Instruments) was installed in a frame of ROV “ Hyperdolphin” . During each dive, the measurements were carried out. The raw data were simultaneously sent to the control room via serial communications, and were stored in a Windows based PC. Prior to use the sensor, it was calibrated using with distilled water contained strong reductant (sodium dithionite). Before each dive, the clock of the storage computer was adjusted to the main clock of the ROV. The data acquisition interval was set to 20 seconds to consider the response time of the sensor. After the dive, the raw data was converted to DO values based on temperature, salinity and depth data provided by on board CTD sensor in ROV and the equations shown in the manuals. Pressure compensation factor used for the conversion was 0.032 (Uchida et al., 2008), instead of 0.04, shown in the manual.

3.11.3. Results

Seventeen DO profiles were obtained in total. The data were shown in Fig. 3-11-1. During the dive #973, computer was slept and DO from 0 m to 680 m were obtained. As the same reason, data were absent in #974. In #980, CTD sensor had a trouble and temperature, salinity and depth data were unrecovered. The DO during this period could not calculate and thus they eliminated from the graph. Note that the data presented here are tentative. The values may vary in case if any corrections are made after the cruise.



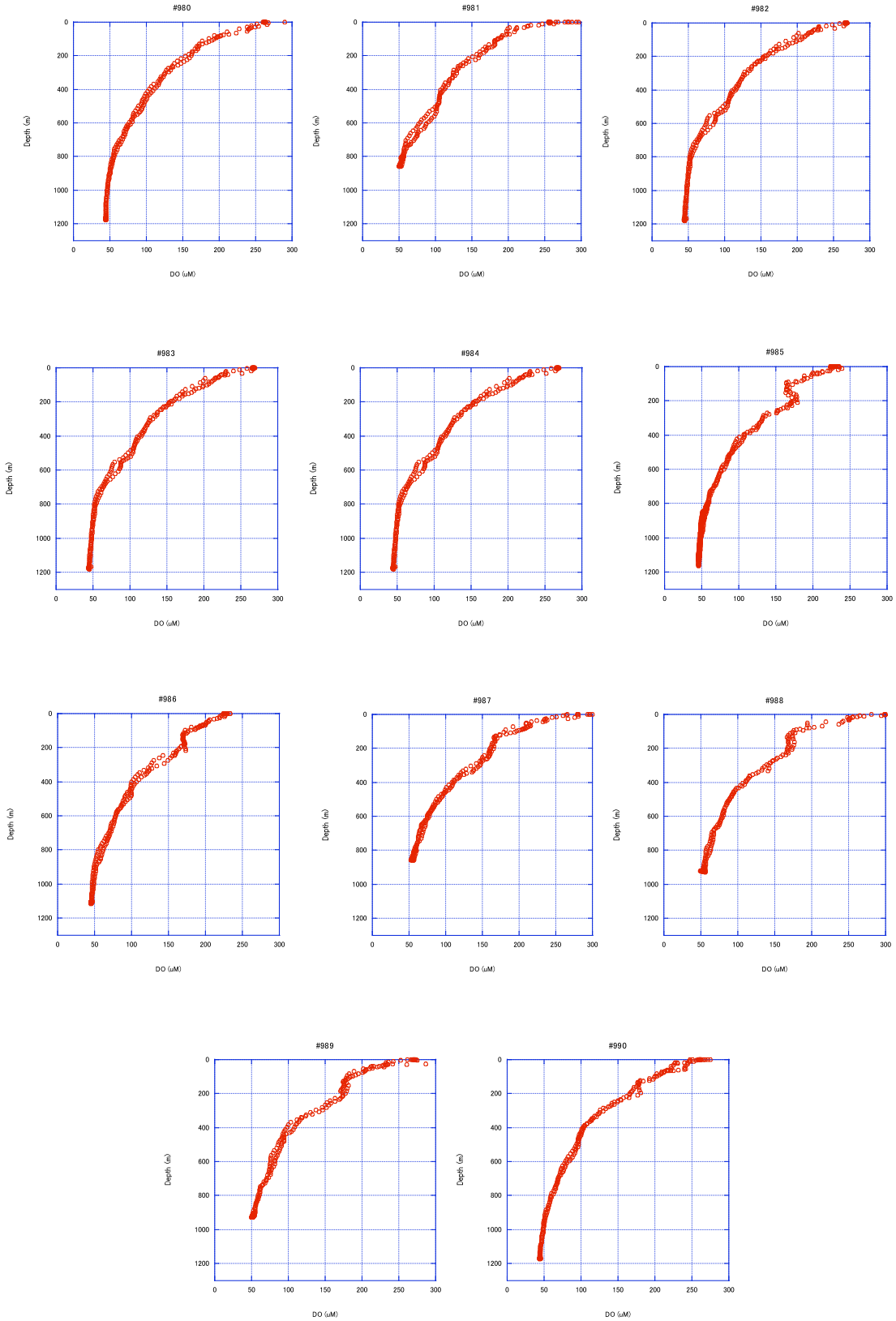


Fig. 3-11-1. DO profiles obtained during the NT09-06 cruise. Respective dive numbers are shown on the top of the graphs.

3.11.4 Reference

Uchida, H. et al. (2008) J. Atmospheric Oceanic Tech., 25, 12, 2271-2281.

3.12. Whale fall community (Fujiwara)

3.12.1. Purpose

Whale carcasses degrading on the sea floor sustain communities of species that specifically feed on tissues or bones, or take advantage of the reduced compounds (H_2S mainly) produced by the bacterial decomposition of the carcass. Many of the species associated with the whale carcasses harbor bacterial symbionts, which contribute to their nutrition. Successional changes have been evidenced in these communities as the skeleton of the whale degrades. The rate of theses changes in community composition seems to depend on the size of the skeleton, its depth, and possibly other environmental factors such as temperature.

Around Japan, 2 sites with implanted carcasses of sperm whales are studied since several years. The first locates off Cape Nomamisaki since 2002 at a depth of 225 m, with temperatures around 12-15°C. The second is at a depth of 925 m, off Hatsushima Island in Sagami Bay (implantation in 2005). There, the temperature is always around 3.5°C. Species found at both sites are different, and the rate of succession of the communities seems to be much lower in Sagami Bay.

Among other species colonizing the bones, special attention has been given to species depending on bacterial symbiosis. One of them is the recently discovered " zombie worm" , or *Osedax*, which feeds on the bones by digging them with a root that contains heterotrophic symbionts. Only one *Osedax* species (*O. japonicus* Fujikura 2006) has been found continuously on the carcasses off Nomamisaki since 2002. In contrast, up to 8 different species where identified on the carcass in Sagami Bay. They appear to have colonized the bones successively, and we do not know whether this succession is due to different metabolic requirements, or if dispersal capacities of the different species are responsible for a more or less early colonization.

The recent implantation, in December 2008, of a new sperm-whale carcass, about 100 meters away from the previously implanted carcass, gave us the opportunity to try to answer that question. By observing and comparing the succession patterns on both carcasses, we can make hypothesis on the mechanisms underlying the succession observed. In addition, this new implantation provides us the opportunity to observe and sample a carcass at its 5^{th} month after implantation. Such early observation had not been possible with the other implanted whales.

The purpose of the present project was first to document the degradation state of the new whale carcass after 5 months, and second to analyze and compare the diversity of species colonizing this new carcass with that of the older carcass implanted in Sagami Bay.

3.12.2. Methods

During 2 dives, we took video images, collected bones and sediments around each of the two whales. Once on the surface, the bones were immersed in tanks with cold seawater, equipped with filters, and the colonizing species were observed and sampled for later barcode analysis (using COI and ribosomal RNA 18S genes). Other species found on the bones or in the sediments collected around the carcass were also observed and preserved for genetic and morphological analysis back in the laboratory.

In addition, some of the specimens were kept alive for future studies of the reproduction and development.

The Hyper-Dolphin suction sampler with canisters equipped with 50 μm mesh was used to filter sea-water around the carcasses and try to collect larval stages of the species colonizing the bones. These samples will be analyzed in the laboratory using in situ hybridization methods to identify the larvae.

3.12.3. Results (expected)

After 5 months on the sea floor, the carcass implanted in December 2008 was completely skeletonized. The sediments surrounding the carcass where covered with white bacterial mats. Rather large *Osedax* specimens were observed, although they did not densely colonized the bones. Some specimens were observed at the back of the skull, on the posterior par of the upper jaw bone, as well as on ribs.

Species of *Osedax* colonizing the bones of the new carcass will be identified using barcodes, and species compositions will be compared with those of the older carcass. If the species composition on the new carcass is similar to that of the old carcass at the time at which it was at the same degradation stage, it is likely that species colonize according to their metabolic capacity to feed on a more or less degraded bone. On the other hand, if species are more similar to those found at the same time on the older carcass, although the degradation is more advanced there, then it is more likely that the dispersal capacities of the larvae are playing a strong role in the colonization patterns. Indeed, the close proximity of the older carcass already colonized, will provide source population close by and facilitate the colonization of the new carcass by the same species.

If the same *Osedax* species are able to colonize bones at different degradation stages, flexibility in the nutrition may be also reflected in flexibility in their association with symbionts. Symbiont associated with the specimens newly recruited on the bones will therefore also be investigated.

4. Dive Results
4.1. List of all the dives (Fujikura)

Dive No.	Date	Survey site	Representative of Proposals	Subject	Landing point		Leaving point	
					Lat., Long., Depth	Time	Lat., Long., Depth	Time
HD#973	2009.4.25	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.943'N, 139-13.371'E, 897 m	8:55	35-00.966N, 139-13.335'E, 854 m	10:10
HD#974	2009.4.25	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.148'N, 139-13.480'E, 1161 m	13:30	35-00.063'N, 139-13.489'E, 1169 m	16:03
HD#975	2009.4.26	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.955'N, 139-13.325'E, 825 m	9:01	35-00.936'N, 139-13.215'E, 797 m	11:05
HD#976	2009.4.27	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.938'N, 139-13.283'E, 858 m	8:52	35-00.935'N, 139-13.222'E, 802 m	12:11
HD#977	2009.4.27	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.938'N, 139-13.246'E, 820 m	14:46	35-00.952'N, 139-13.321'E, 857 m	16:54
HD#978	2009.4.28	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.092'N, 139-13.538'E, 1179 m	9:02	35-00.188'N, 139-13.485'E, 1175 m	10:42
HD#979	2009.4.28	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.070'N, 139-13.543'E, 1179 m	13:54	35-00.092'N, 139-13.516'E, 1176 m	16:55
HD#980	2009.4.29	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	ROV mechanical accident			
HD#981	2009.4.29	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.946'N, 139-13.251'E, 810 m	11:34	35-00.959'N, 139-13.334'E, 855 m	13:34
HD#982	2009.4.29	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.073'N, 139-13.522'E, 1170 m	16:27	35-00.188'N, 139-13.463'E, 1176 m	17:57
HD#983	2009.4.30	Off Hatsushima Island site, Sagami Bay	K Oguri （JAMSTEC）	堆積物－水境界における親生物素循環の解明のための、幅、奥行き、深さ、時間の四次元観測手法の確立	35-00.127'N, 139-13.663'E, 1213 m	9:00	35-00.153'N, 139-13.517'E, 1184 m	12:18
HD#984	2009.4.30	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.055'N, 139-13.507'E, 1176 m	14:54	35-00.145'N, 139-13.509'E, 1184 m	17:09
HD#985	2009.5.1	Okinoyama Bank site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	34-58.396'N, 139-31.173'E, 1164 m	9:07	34-58.357'N, 139-31.529'E, 1102 m	16:29
HD#986	2009.5.2	Okinoyama Bank site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	34-58.352'N, 139-31.485'E, 1118 m	9:06	34-58.372'N, 139-31.558'E, 1095 m	17:04
HD#987	2009.5.4	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.931'N, 139-13.251'E, 819 m	8:59	35-00.963'N, 139-13.323'E, 853 m	13:03
HD#988	2009.5.4	North-west Off Hatsushima Island site, Sagami Bay	Fl. Pradillon （JAMSTEC）	初島北東沖鯨骨生物群集の遷移と移入機構に関する研究	35-04.911'N, 139-13.004'E, 929 m	16:06	35-04.94'N, 139-12.970'E, 917 m	18:59
HD#989	2009.5.5	North-west Off Hatsushima Island site, Sagami Bay	Fl. Pradillon （JAMSTEC）	初島北東沖鯨骨生物群集の遷移と移入機構に関する研究	35-04.971'N, 139-13.037'E, 928 m	8:52	35-04.937'N, 139-12.977'E, 918 m	12:15
HD#989	2009.5.5	Off Hatsushima Island site, Sagami Bay	K Fujikura （JAMSTEC）	シロウリガイとシマイシロウリガイの違いは何か？	35-00.08'N, 139-13.527'E, 1174 m	17:20	35-00.072'N, 139-13.503'E, 1170 m	19:08

4.2. Preliminary dive results

4.2.1. Dive #973, 25 April 2009, Off Hatsushima Island, 800-900 m deep site (Furushima)

Date: April 25, 2009
Site: 800 – 900m site of seep community, off Hatsushima Island in Sagami Bay
Landing: Time 08:55 Lat 35°00.943' N, Long 139°13.371' E, Depth 897m (WGS84)
Leaving: Time 10:10 Lat 35°00.966' N, Long 139°13.337' E, Depth 855m (WGS84)
Purpose:
Install ADCP(Acoustic Doppler Current Profiler) in Hatsushima offing seep community site.
Using MBARI core, collect Foraminifera and a microbe.
Collect sediment using MT core.
Using Suction sampler system, collect several Calyptogena.
Dive Summary
ADCP was installed. (measurement interval: 10 minutes)
Sediments sampling was carried out with MBARI and MT core sampler.
Organism observation.
Samplings such as Calyptogena specimens using Suction sampler system.
(Note)
ADCP is recovery on May 4.

1. 08:55 着底 D=897m
(35-00.943N 139-13.371E)
2. 09:00 D=871m ｶﾙﾃﾞﾗﾊﾓｽｿ視認
(35-00.955N 139-13.344E)
3. 09:03 D=864m ｼｮｳｶﾞｶﾞｲｺﾛﾆｰ視認
(35-00.954N 139-13.341E)
4. 09:14 D=853m ADCP(ROVﾎﾙﾀｰ:ID=58付)設置
(35-00.970N 139-13.337E)
09:22 MBARI採泥(緑青・1本)
09:25 MBARI採泥(青赤・1本)
09:30 MBARI採泥(黄赤・1本)
09:39 MT採泥(黒・1本)
5. 10:02 D=854m MT採泥(緑・1本)
(35-00.966N 139-13.335E)
10:09 ｽﾗｰﾌﾟｶﾞﾝによるｼｮｳｶﾞｶﾞｲ採集(数個体)
10:10 離底 D=855m

139° 13. 40E

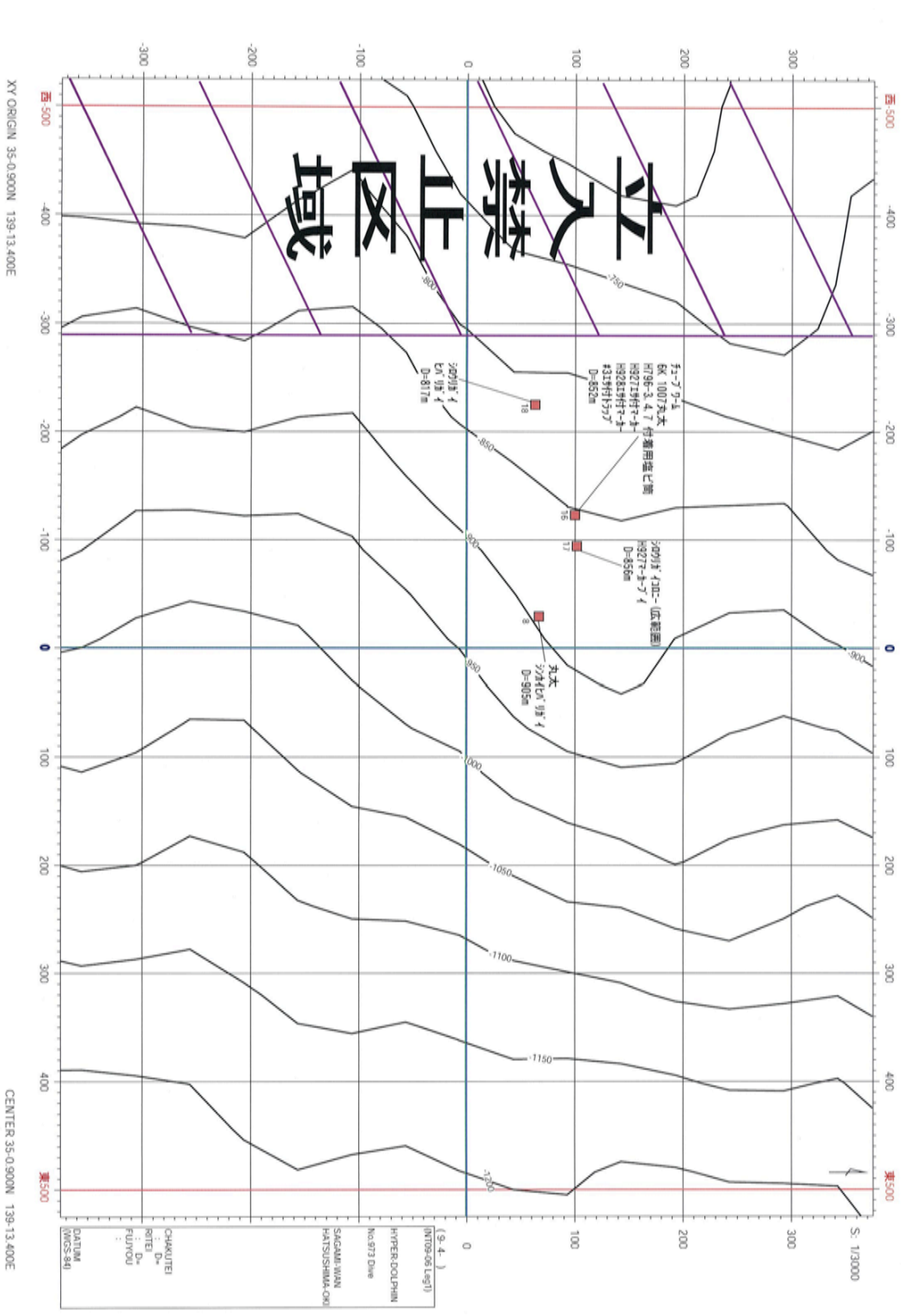
35° 00. 90N

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
＃９７３ ＤＩＶＥ
２００９年０４月２５日
相模湾 初島沖
縮尺 １／３０００

測 位 D-GPS(MX9400 LEICA)
測地系 WGS-84 DATUM (世界測地系)
音 速 １４８９．１ｍ／ｓ (D＝９００ｍ)



Video Log

NT09-06			Area: Sagami Bay off Hatsushima	25-Apr-09
HPD Dive #		973		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:10	0	0	着水	

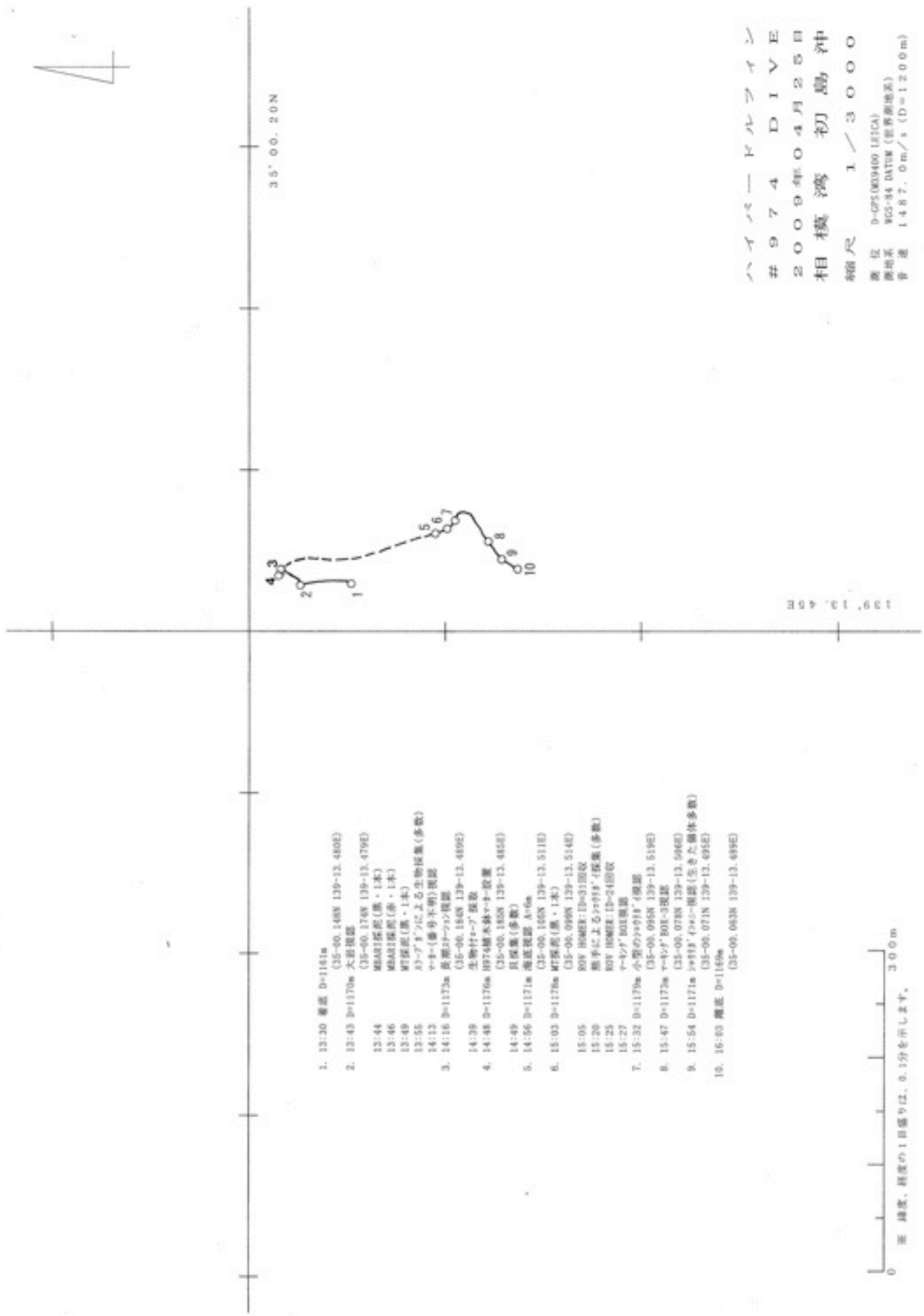
8:19	0	0	潜航開始	
8:31	210	0	中層観察用カメラ設定完了	
8:49	700	0	生物？	
8:54	862	0	中層観察終了	
8:55	897	0	着底	ゲンゲ
8:59	877	0		カニ
9:00	871	0	サガミハオリムシ確認	
9:01	870	0	シロウリガイ類死殻多数	
9:00	860	0	ゲンゲ２匹	
9:05	857	0	ハオリムシ多数	
9:07	854	0	かに	
9:08	854	0	魚（ソコダラ？サメ？）	
9:09	853	0	着底	
9:12	853	0	ADCP 設置	
9:14	853	0	ADCP 設置完了	
9:19	853	0	MBARI コア（緑青）採集開始	
9:20	854	0	MBARI コア（緑青）採集	
9:23	854	0	MBARI コア（緑青）採集完了	
9:24	853	0	MBARI コア（青赤）採集開始	
9:24	854	0	MBARI コア（青赤）採集	
9:25	854	0	MBARI コア（青赤）採集完了	
9:28	853	0	MBARI コア（黄赤）採集開始	
9:30	854	0	MBARI コア（黄赤）採集	
9:30	854	0	ゲンゲ	
9:31	854	0	MBARI コア（黄赤）採集完了	
9:33	854	0	MT コア（青）採集開始	
9:38	854	0	MT コア（青）採集	
9:39	854	0	MT コア（青）採集終了	
9:41	854	0	ハダカイワシ	
9:49	855	0	着底	
9:56	855	0	植木鉢破損	
10:00	855	0	MT コア（緑）でシロウリガイとオオウナガイ採取	
10:05	854	0	スラープガンによりシロウリガイ採取開始	
10:08	854	0	スラープガンによりシロウリガイ採取終了（キャニスターBOX）	
10:11	854	0	離底・浮上	

4.2.2. Dive #974, Off Hatsushima Island, 1100 m deep site (Fujikura)

Date: April, 25, 2009
Chief observer: 藤倉克則
Dive site: Off Hatsushima Island site, Sagami Bay.
Purpose: 湧水域の生物，堆積物採集と観察
Dive Summary

- 下降中はHDTVで中・深層生物の観察を行った
- 初島沖長期ステーション付近の変色域１１７０ｍに潜航．変色域はオレンジ色，灰白色，黒色．
- 変色域に高さ１m程度の露頭2カ所あり，そこにヘイトウシンカイヒバリガイ，シンカイヒバリガイ，ツブナリシャジク，サガミハイカブリニナなどが分布．露頭表面は所々白色に変色．シンカイヒバリガイ類の殻上にはツブナリシャジクの卵塊
- オレンジ色変色域の堆積物を2本のMBARI-type コアと) MT コアで採集．堆積物はとても柔らかい．海底下２０ｃｍくらいに固いもの（おそらく炭酸塩岩）があるらしく，コアは深くまで刺さらない．
- ヘイトウシンカイヒバリガイ，シンカイヒバリガイ，ツブナリシャジク採集．エゾイバラガニがゲスト種として変色域露頭上に分布しており，それを採集，
- 変色域西側に３mほどの露頭．露頭表面にシンカイヒバリガイ類はいるがツブナリシャジクは見えない．海藻が海底上にある．海藻上にエゾバイ類，それを採集．
- 長期ステーション横の灰白色変色域に高密度のサガミハイカブリニナ．これまでこの現象はみたことない．
- 旧ステーション台座から，サガミマンジガイの卵塊が付着することを期待しロープと反射材を採集．植木鉢マーカーを設置し，サガミマンジガイをスラープガンで採集．
- サガミマンジガイの密集域を5×10mの範囲に発見．サガミマンジは吻を伸張させる．ここにはゲンゲ類とエゾイバラが分布．
- 初島沖南側の群集域に向かう．シロウリガイコロニーで未回収であったROVホーマー2本発見し回収．元気の良いパッチは多くはない．シロウリガイと堆積物を同時にMTコアで採集したが，船上で硫化物濃度は測定できなかった．横スリット型のMTコアは使えない．シロウリガイ類を熊手サンプラーで採集しサンプルボックスへ収納．うち8個体を船上で遺伝子解析したところ全てシロウリガイでシマイシロウリガイは認められない．
- かつて設置したin situマーキングボックス視認．
- シロウリガイ類死殻に多数のワタゾコヤドリガサBathyacmaea nipponicaが高密度．付近に水管のみ出すシロウリガイ類

Track Line



ハイパードルフィン
#974 DIVE
2009年04月25日
相模湾 初島沖
縮尺 1／3000
測位 D-GPS(MX9400 LEICA)
測地系 WGS-84 DATUM（世界測地系）
音速 1487.0m/s（D=1200m）
35°00.20N
139°13.45E
1. 13:30 着底 D=1161m
(35-00.148N 139-13.480E)
2. 13:43 D=1170m 大岩視認
(35-00.174N 139-13.479E)
13:44 MBARI採泥(黒・1本)
13:46 MBARI採泥(赤・1本)
13:49 MT採泥(黒・1本)
13:55 スラープガンによる生物採集(多数)
14:13 マーカー(番号不明)視認
3. 14:16 D=1173m 長期ステーション視認
(35-00.184N 139-13.489E)
14:39 生物付きロープ採取
4. 14:48 D=1176m HD974潜航マーカー設置
(35-00.185N 139-13.485E)
14:49 貝採集(多数)
5. 14:56 D=1171m 海底視認 A=6m
(35-00.166N 139-13.511E)
6. 15:03 D=1178m MT採泥(黒・1本)
(35-00.099N 139-13.514E)
15:05 ROV HOMER:ID=31回収
15:20 熊手によるシロウリガイ採集(多数)
15:25 ROV HOMER:ID=24回収
15:27 マーキングBOX視認
7. 15:32 D=1179m 小型のシロウリガイ視認
(35-00.095N 139-13.519E)
8. 15:47 D=1173m マーキングBOX-3視認
(35-00.078N 139-13.506E)
9. 15:54 D=1171m シロウリガイコロニー視認(生きた個体多数)
(35-00.071N 139-13.495E)
10. 16:03 離底 D=1169m
(35-00.063N 139-13.499E)
※ 緯度、経度の1目盛りは、0.1分を示します。
0 300m

Video Log

NT09-06 Area: Sagami Bay off Hatsushima 25.Apr.09

HPD Dive # 974

Time	Depth	Alt.	HDTV Camera Remarks(+CCD)
12:41	0		着水
12:51	0		潜航開始
12:52	48		中層観察開始
13:23	943		Strange shiny red organism (too fast for identification)
13:30	1161	0.7	We can see the sea floor.
13:32	1164	1	Soft sediment, slightly irregular surface. and black fishes
13:35	1166	2.3	Hard substrate (mussels colony) in soft sediment. 1eel? Fish over sediment water interface
13:38	1170	0.5	redish and black sediment (patchy distribution - bacterial mats) with local concretion
13:42	1170	0.5	Black MBARI core in red-black sediment
13:45	1170	0.5	Red MBARI core in red-black sediment
13:48	1170	0.5	MT core in red-black sediment
13:50	1170	0.5	Observation; concretion of mytilid mussels and gastropods
13:54	1170	0.6	Observation; one pink crab on the concretion
13:55	1170	0.6	Sampling of crab, mussels, gastropods with succion sampler.
14:00	1170	0.6	A block with mussels is sucked and put into the basket
14:05	1170	0.5	マーカーの側まで移動
14:09	1170	0.5	スラープガンによるカニとゲンゲ採集
14:15	1174	1	エビ遊泳
14:16	1174	1.7	ステーション前へ
14:17	1175	1.7	魚類遊泳
14:18	1177	0	海底に小さな巻貝多数
14:20	1177	0	魚類遊泳
14:21	1177	0	魚類遊泳，エビ
14:22	1177	0	人工物に巻き貝１個体
14:35	1177	0	海底にあったロープを引っ張る
14:37	1177	0	切れたロープをスラープガンで回収
14:39	1177	0	スラープガンで海底を吸引
14:43	1174	3.5	海底にサガミマンジガイ群
14:45	1176	0	カニ
14:46	1176	0	ゲンゲ
14:47	1176	0	植木鉢マーカー設置
14:48	1176	0	スラープガンによるサガミマンジガイ採集
14:57	1174	2.6	クラゲ，ホーマー（H24）
14:57	1178	0	シロウリガイ
15:00	1178	0	MT コア
15:02	1178	0	MT コア打ち込み後に回収
15:04	1178	0	ROV ファーマー回収１
15:05	1178	0	熊手でシロウリガイ採集
15:08	1178	0	熊手１回目シロウリガイ
15:11	1178	0	熊手２回目シロウリガイ
15:15	1177	0	熊手３回目シロウリガイと巻貝
15:19	1177	0	熊手４回目シロウリガイ採集

15:23	1177	0	熊手回収
15:24	1177	0	ROV ファーマー回収２
15:26	1176	1	マーカーボックス確認
15:28	1176	0	マーカーボックス確認終了
15:30	1177	1.4	カニ類
15:31	1179	0	小型シロウリガイ群集
15:34	1179	0	小型シロウリガイ群集
15:35	1179	0	小型シロウリガイ群集
15:36	1179	0	シロウリガイ死骸殻につく巻き貝をスラープガンで採集
15:38	1178	1	イバラガニ類
15:40	1177	0.9	イバラガニ類
15:41	1177	0.5	岩を調査１
15:42	1176	1.2	岩を調査２
15:44	1175	1	岩を調査３
15:45	1173	1.4	イバラガニ類２個体
15:47	1173	0.5	古いマーキングボックス
15:49	1170	1.4	イバラガニ類２個体
15:50	1171	0	生きているシロウリガイ
15:53	1170	0.5	生きているシロウリガイ
15:54	1171	0	イバラガニ類
15:54	1171	0	生きているシロウリガイ大型個体多い場所
15:55	1171	0	イバラガニ類２個体
15:57	1169	0.6	イバラガニ類
15:58	1168	0.9	イバラガニ類
15:58	1167	1.5	岩石群
15:59	1169	0	生きているシロウリガイ
16:00	1169	0	浮上準備
16:03	1164	0.5	離底

4.2.3. Dive #975, 26 April 2009, Off Hatsushima Island, 800-900 m deep site (Watanabe)

Date: April 26, 2009

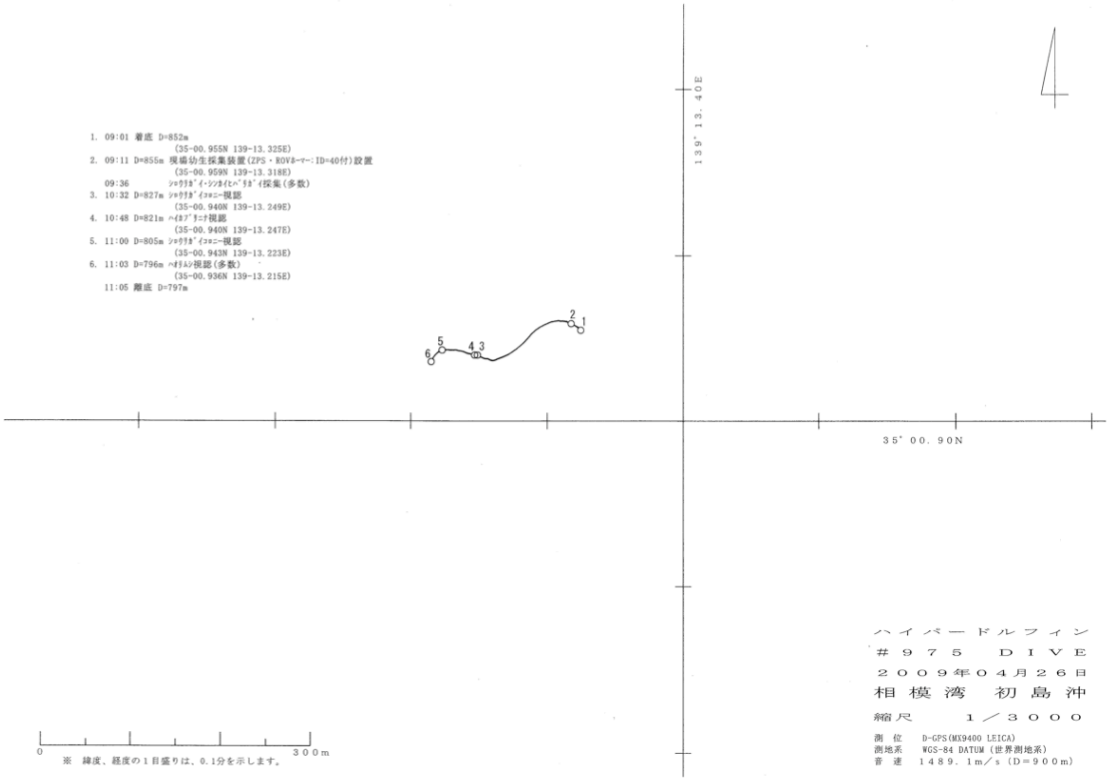
Dive site: Off Hatsushima Island site, Sagami Bay

Purpose: 動物プランクトンサンプラー（ZPS）の設置，生物採集

Dive Summary

- ZPS が搭載されているため，下降中 HDTV の視野はほとんどなし.
- 水深 852m の ADCP 設置場所付近に潜航．シロウリガイ類，シンカイヒバリガイ類コロニー上に ZPS を設置.
- 周辺観察およびシロウリガイ類，シンカイヒバリガイ類の採集.
- エゾバイ，ヒトデ，ヒザラガイの採集.
- ZPS の作動確認.
- コロニーの縁辺域に移動し，シロウリガイ類，シンカイヒバリガイ類を採集.
- 水深 800m 付近のサイトへ向けて移動
- エゾイバラガニを発見，採集.
- マーカーおよび生物群集を視認.
- 現場染色実験を実施するシロウリガイ類コロニーを探索．周辺の観察を行いながら，シロウリガイ類コロニーに沿って着底と航走を繰り返す.
- 立ち入り禁止区域の前にて離底.

Track Line



NT09-06			Area: Sagami Bay off Hatsushima	26.Apr.09
HPD Dive #		975		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:10	0		着水	
8:20	0		潜航開始	

8:31	240		魚	
9:03	855	0	着底	
9:11	856	0	プランクトンサンプラー設置	
9:24	856	0	スラープガンでシロウリガイ類採集（５個体程度）	
9:28	856	0	シンカイヒバリガイ類採集（１２個体程度）	
9:38	856	0	ハオリムシ	
9:44	856	0	エゾバイ採集（１個体）	
9:44	856	0	ヒトデ（足のみ）採集	
9:49	856	0	エゾバイ採集（１個体）	
9:50	856	0	シンカイヒバリガイ類採集（１０から２０個体程度）	
9:53	856	0	ヒザラガイ採集（１個体）	
10:00	856	0	プランクトンサンプラー稼働	
10:01	856	0	プランクトンサンプラー動作目視確認完了	
10:02	856	0	シロウリガイ類採集のため移動	
10:03	854	0.5	着底　シロウリガイ類採集	
10:05	854	0	シロウリガイ採集　開始	
10:12	854	0	シロウリガイ採集　終了	
10:14	854	1.1	移動　シロウリガイ類の別の群集	
10:16	851	0.6	エゾイバラガニ採集開始	
10:20	851	0.6	エゾイバラガニ採集完了	
10:20	851	0	移動	
10:21	846	1.5	ハオリムシ群集確認	
10:23	837	1.7	移動中　ユメカサゴ確認	
10:25	828	0	シロウリガイ類群集確認　着底	
10:29	825	0	シロウリガイ類観察	
10:33	852	0	シンカイヒバリガイ類群集確認	
10:35	852	0	シロウリガイ，シンカイヒバリガイ，ハオリムシ確認	
10:40	823	0	シロウリガイ観察	
10:44	824	0	シンカイヒバリガイ類群集内にハイカブリニナ確認	
10:46	824	0.5	ハオリムシ群集　カイメン確認	
10:50	813	3.8	シロウリガイ類群集確認	
10:54	808	0	シロウリガイ観察	
10:58	803	2.8	川のようなシロウリガイ類群集	
10:59	805	0.7	マーキングボックス実験候補地点探索	
11:01	805	0.8	群集の終わりまで見に行く	
11:02	801	2	ハオリムシ群集　複数ー多数	
11:03	796	1.5	立ち入り制限前　着底	
11:06	792	6	離底	

4.2.4. Dive #976, 27 April 2009, Off Hatsushima Island, 800-900 m deep site (Yoshida)

Site: 800-900m site of seep community, Off Hatsushima Island, Sagami Bay
Chief observer: Takao YOSHIDA（JAMSTEC）
Purpose: Deployment of in situ gamete sampler
Sediments sampling using MBARI cores for foraminifera and microbe.
Crab & gastropods sampling using suction sampler system
Calyptogena, Bethymodiolus speciments sampling using scoop sampler

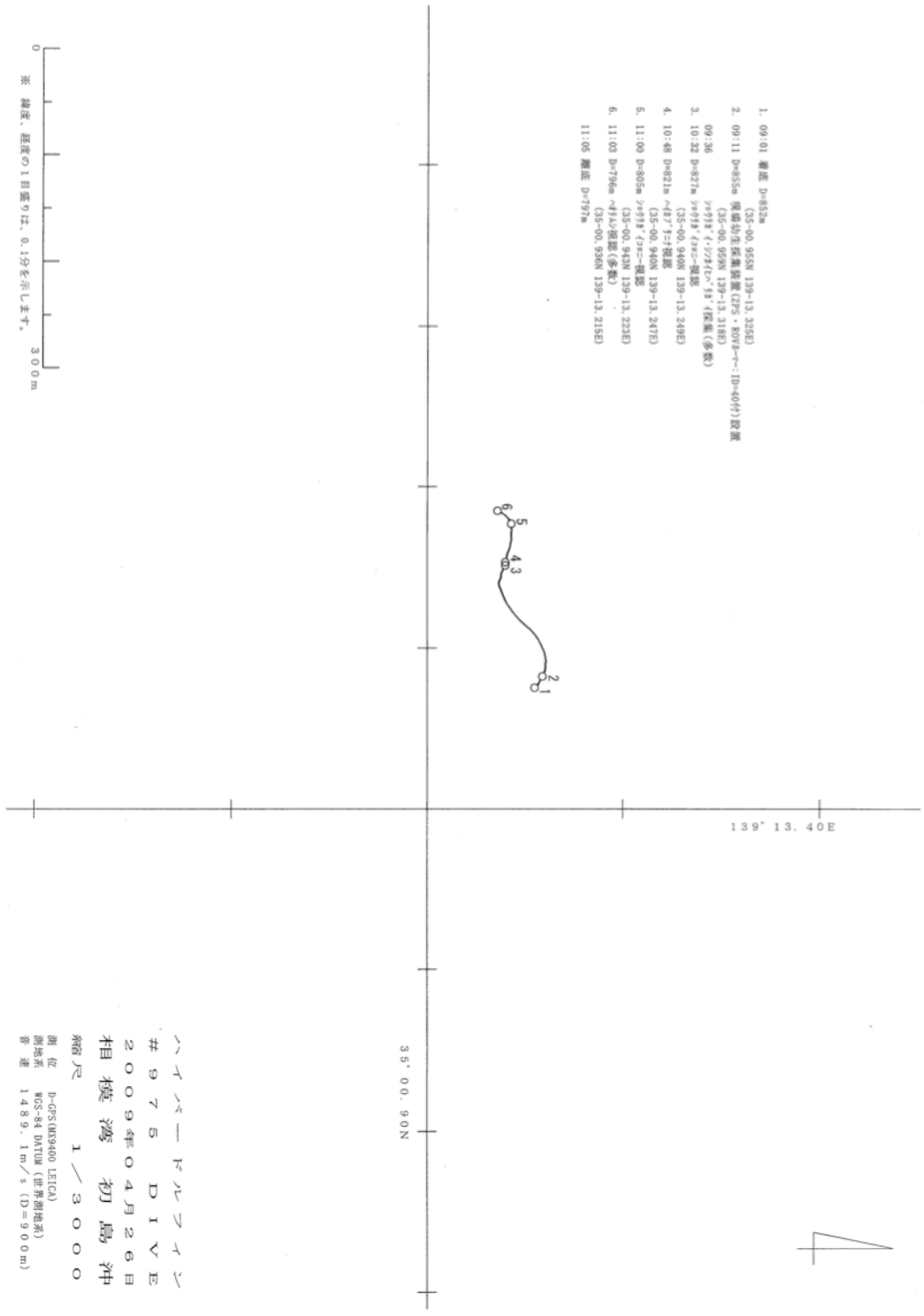
Payload equipments: in situ gamete sampler, Suction sampler system, Scoop sampler, small sample box, MT-type core sampler (X2), MBARI-type core sampler(X2), and Marker (X2).

Dive summary
To collect the Calyptogena gametes, in situ gamete sampling was tried. Gamete sampler was deployed at 803m site (35-00.941N, 139-13.222E). However, sparms and eggs were not obserbed. After sampling of water in the gamete sampler, Calyptogena clams in the sampler were collected by suction sampler. The segiments in calyptogena colony were collected by MT-type core (X2) and MBARI-type core (X2).

Sampling & Marker point

Sample		Time	Depth	Locality
(1)	Water in gamete sampler	11:17	803m	35- 0.935N,139-13.222E
(2)	Calyptogena spp.	11:43	803m	35- 0.935N,139-13.222E
(3)	MT-type core (Green)	11:49	802m	35- 0.935N,139-13.222E
(4)	MT-type core (Black)	12:00	802m	35- 0.935N,139-13.222E
(5)	MBARI-type core (Red)	12:03	802m	35- 0.935N,139-13.222E
(6)	MBARI-type core (Yellow)	12:06	802m	35- 0.935N,139-13.222E
(7)	Flowerpod marker	12:09	802m	35- 0.935N,139-13.222E

Track line



Video log

NT09-06			Area: Sagami Bay off Hatsushima	27.Apr.09
HPD Dive #		976		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:10	0		着水	
8:20	0		潜航開始	

8:23	45		中層観察開始	
8:32	420		魚	
8:52	857		中層観察終了	
8:59	837		イソギンチャク	
9:00	835		カニ	
9:01	832		魚	魚
9:02	828		魚	
9:05	817		イソギンチャク	魚
9:13	805		魚（カサゴ）	
9:17	805		着底	
9:20	805		加温ボックス設置開始	
9:23	805		魚	
9:25	805		エビ	
9:26	805		魚	
9:37	805		加温ボックス設置　中止,　移動	
9:42	803		着底	
9:42	803		加温ボックス設置　開始	
9:56	803		加温ボックス設置　完了	
9:56	803		１５分間静止（午前１０時１５分再開予定）	
10:17	802		加温開始	
10:30	802		目視観察中	
10:45	802		目視観察継続中	
10:45	802			
11:00	802		吸い込み開始	
11:01	802		流水目視するも判断できず	
11:02	802		別角度から目視	
11:03	802			バックの膨らみを目視試行
11:05	802			貝を目視
11:07	802		バックの膨らみを確認	
11:09	802		少しづつ膨らみを増している	
11:11	802			小さなヨコエビのようなものが貝の周辺で不定期に確認される
11:12	802		バックの膨らみをアップで確認	
11:13	802		クラゲ？通過	
11:14	802		バックの膨らみを確認中	
11:16	802			水管？から水を拭いて泥が巻き上がった
11:17	802		吸い込み終了	
11:18	802		装置全景に移動	作業全景に移動
11:18	802		装置回収開始	
11:22	802		装置持ち替え	通常の懸濁物
11:25	802		装置回収中	周囲の堆積物はオリーブグリーン 貝周辺はわずかに黒い
11:27	802		装置回収終了	
11:27	802		スラープガンで観察対象回収開始	
11:28	802	1.7	わずかに浮上，位置修正	
11:29	803	0	着底	

11:29	803	0	対象目視にて確認	
11:30	803			ホース振り回し泥落とす.
11:30	803	0.7	ホース確認	作業全景
11:30	803	0.7	ホース内泥目視，振り落とす	
11:31	803		ホース MT のあたり	
11:33	803		左マニピュレータでホース掴む	
11:35	803		シロウリガイ吸い込み開始	
11:36	803		つまった物を再度取り込むが大きくて入らない	
11:37	803		ホース内につまり	
11:38			左マニピュレータでホース掴む　つまっていた物落下	
11:39	803	0.6	再度吸い込み開始	
11:43	803		貝は下半分が黒変．堆積物も黒っぽい.	
11:43	803		スラープガン終了	
11:44	803		黒変堆積物をコア採取地点として指示移動	
11:45	802	0.6	MT 開始（緑）	T３．８９９，DO1.1, S34.329
11:47	802		隣をよけてシロウリガイを含む形で採集＊まきあげ	
11:47	802		MT(緑）差し込み	
11:49	802		mt（緑）抜き　コアの１／２リカバリ	
11:50	802		さやに収まる　内部　わずかに舞い上がり	
11:50	802		MT(黒）開始	
11:52	802		堆積物表面黒いところ，大半が埋没してる個体，ナナメ	T3.865　DO1.1　S34.332
11:53	802		差し込み　最後垂直　半分程度で堆積物堅い.　　捨て	
11:54	802	0.5	ハオリムシ目視	
11:55	802	0.5	新目標決定　岩がち	T
11:56	801	1.7	移動	
11:56	801.5	0.9	ハオリムシ近隣	
11:58	801.5	0.8	コア挿入開始　シロウリ一個体含有	T3.830,DO1.1 S34.334
11:58	801.5		２０cm 前後で固い	
11:59	801.5		コアリカバリ　一部落下したが回収　少し舞上げ	
12:01	801		MBARI(赤)挿入	
12:03	801		MBARI(赤)回収	
12:04	802		MBARI(黄色)挿入	
12:05	802		MBARI(黄色)回収	
12:09	802		植木鉢マーカー設置	
12:11	802		離底	

4.2.5. Dive #977, 27 April 2009, Off Hatsushima Island, 800-900 m deep site (Maruyama)

Date: April 27th, 2009/04/27

Purpose of the dive:

1. Staining Calyptogena clam shells with calcein and strontium for measuring their growth.
2. Collection of some vestimentiferan tubeworms (Lamellibrachia sp. and Alaysia sp.) with a magic hand. Keep the samples in a Middle size Box (Sample B).
3. Collection of some Calyptogena clams and Bathymodiolus mussels by a suction sampler (Sample S).

Landing Site: 35-00. 938N: 139-13.246E (Time=14:46, D=820m)
Leaving Site: 35-00, 952N: 139-13.321E (Time=16:54, D=857m)

Dive summary

At 15: 12 (D=805 m), a small colony of Calyptogena clams, which were almost completely buried in the sediments and extended their siphons from the sediments, were found (Position 35-00.937N 139-13.223E, D=805m). The staining device (box) was covered on the colony and staining dye was introduced into the device by pumping (From 15:23 to 15:48).
At 16:11 (D=853 m: 35-00.944N 139-13.305E), deep-sea water was collected with two Niskin water samplers.
At 16:15, a sediment core was collected with an MBARI core sampler.
At 16:23, Vestimentiferan tubeworms (Lamellibrachia sp. and Alaysia spp.) were collected by magic hands.
At 16:30, Calyptogena clams and other bethic animals were collected by the suction sampler.
At 16:42 (D=855 m, 35-00.952N 139-13.321E) The zooplankton sampler, which had been deployed yesterday (HD dive #975), was observed. It seemed to be OK.
At 16:48, Bathymodiolus mussels were collected by the suction sampler.

Animal samples were collected as planned. We paid attention to conserve the local animal communities in the sampling area.

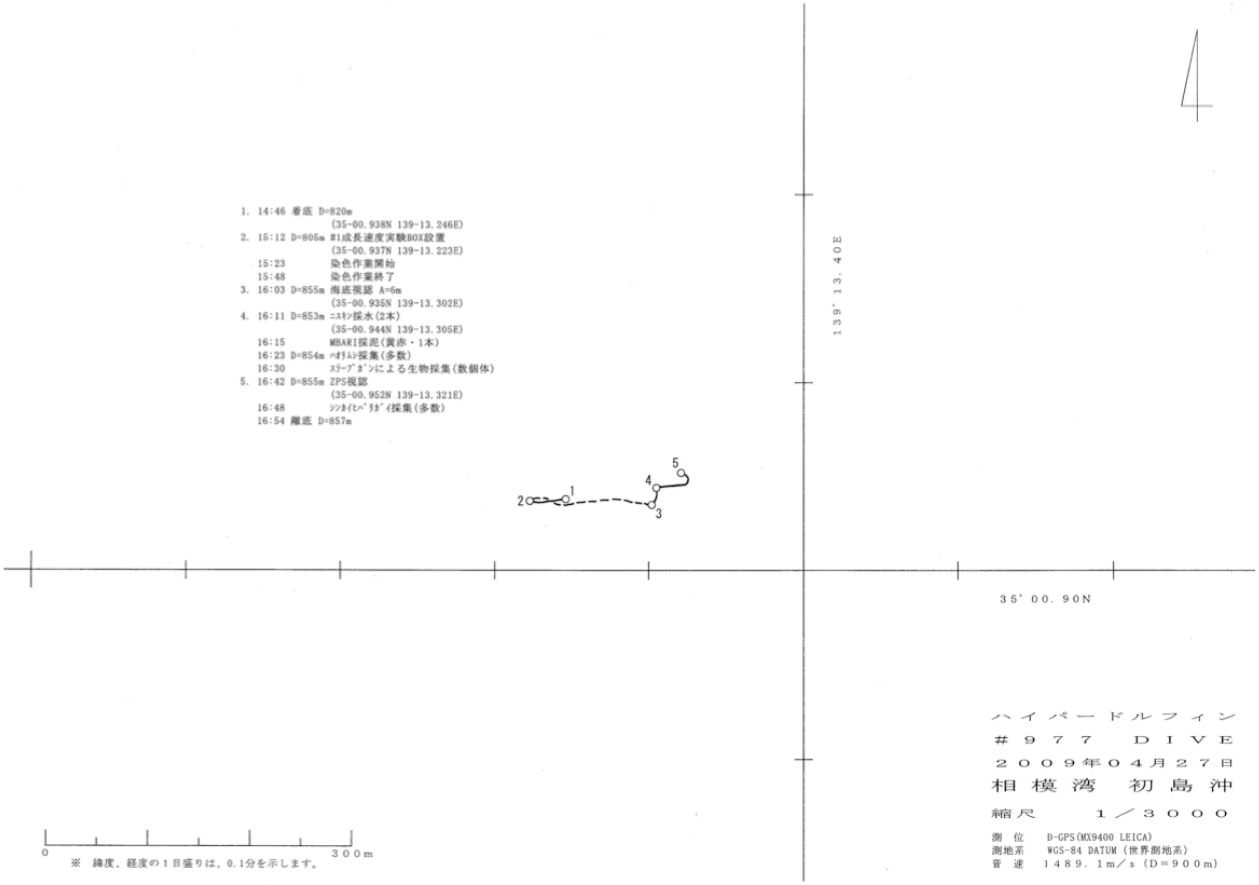
Dive Log

Dive log /

NT09-06			Area: Sagami Bay off Hatsushima	27-Apr-09
HPD Dive #		977		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
14:10	0	0	潜航開始	
14:23	113	0	魚	
14:31	310	0	エビ	
14:32	369	0	クラゲ？	
14:34	432	0	エビ	
14:36	497	0	クラゲ	
14:38	538	0	エビ？	
14:41	653	0	クラゲ	
14:42	719	0	クラゲ	
14:46	819	0	中層観察終了	

14:47	819	2.7	イソギンチャク	
14:47	817	3.5	魚	
14:48	815	3.5	魚	
14:48	813	4.6	シロウリガイ殻多数，ヒトデ	
14:49	810	3.4	魚	
14:50	809	3.3	カニ	
14:51	808	2.8	ハオリムシ	
14:53	807	1.3	魚	
14:54	807	0.8	着底，ヒトデ	
14:55	807	0.7	移動開始	
14:56	805	1.2	ヒトデ	
14:57	805	1.5	魚	
14:57	804	1.3	小さなシロウリガイ	
14:58	804	0.8	着底，魚	
14:59	804	0.9	小さなシロウリガイ，カニ	
15:00	804	1	海底から水管多数	
15:01	804	0.8	イバラガニ類	
15:02	804	1	水管多数確認	
15:06	804	1	現場マーキング装置（染色実験）設置開始	
15:10	804	1.1	再設置開始	
15:12	804	1.1	設置完了	
15:15	804	1	右のアームで栓を持つ	
15:16	804	1	試しに左アームで染色放出口を持って染色液を少し放出した	
15:20	804	1.1	染色放出口をボックスに差し込む	
15:23	804	1.1	染色液を注入開始	
15:34	804	1	ボックス右後方周辺にも水管多数	
15:36	804	1.1	ボックス左周辺にもシロウリガイ多数	
15:45	804	1.1	右のアームで栓をする（染色終了）	
15:46	804	1.1	左のアームで染色放出口をボックスからはずす	
15:48	804	1.1	左のアームで栓をする	
15:51	804	1.1	ポンプ停止	
15:52	804	1.3	ヒトデ	
15:55	805	1.6	ボックスを撮影する	
16:04	855	6.5	移動地点到着	
16:06	853	4.1	大型の魚（オオサガ？）	
16:07	852	3	ハオリムシ採集地点到着（大きな岩）	
16:09	853	0.7	着底	
16:10	853	0.7	アーム始動	
16:13	853	0.7	MBARI コアハオリムシ群集の側で挿入	
16:14	853	0.5	コア回収	
16:16	853	0.5	左アームでサンプルボックスを開ける	
16:17	853	0.5	赤いえび	
16:18	853	0.5	左アーム，ハオリムシ採集，ゲンゲが飛び出す	

16:20	853	0.5	二回目回収	
16:21	853	0.5	３回目回収，魚飛び出す	
16:23	853	0.5	ボックスの蓋を閉める	
16:24	853	0.5	採集後の群集クローズアップ	
16:25	853	0.5	群集手前のシロウリガイクローズアップ	
16:26	853	0.5	スラープガン使用のため位置を調節	
16:29	853	0.5	スラープガン，ハオリムシ群集内サンプリング，ゲンゲ飛び出す	



4.2.6. Dive #978, Off Hatsushima Island, 1100 m deep site (Imai)

Date: April 28, 2009

Dive site: 1100 m site of seep community, off Hatsushima Island in Sagami Bay

Purpose: 染色マーキングによるシロウリガイ類２種の潜る深さの違いをみること、堆積物と生物の採集

Dive Summary

＊８時 22 分 潜航開始。

＊下降中は HDTV で中・深層の浮遊生物の観察。

＊9 時 02 分着底 1179m。

＊染色マーキング用ボックスをシロウリガイ類群集に設置し、染色液（アシッドブルー）を注入して無事に設置完了。ボックス設置付近にて MBARI-type コアで堆積物を採集し、スラープガンでシロウリガイ類７個体を採集。マルチプレックス PCR による母親判定は、７個体中４個体がシロウリガイ C.soyoae であった。

＊長期ステーション方面へ移動中に MBARI-type コアで堆積物を採集（海底はやわらかい）。

＊長期ステーションに到着後、サガミマンジ群集を確認し MBARI-type コアで堆積物を採集（海底は比較的やわらかい）。直後にスラープガンでサガミマンジを採集。

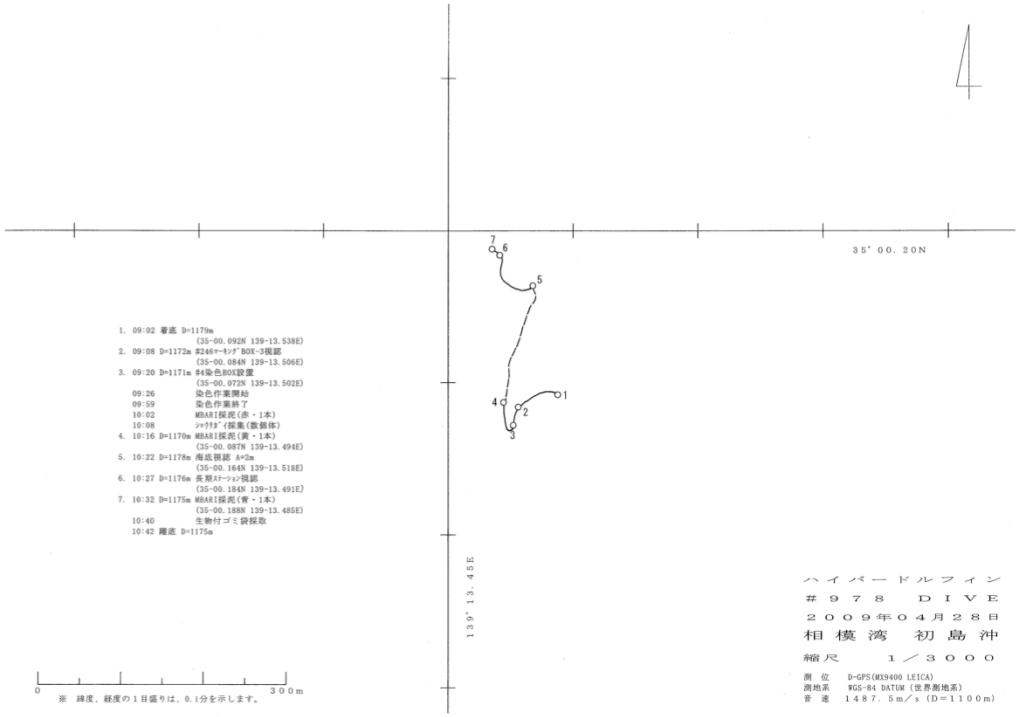
＊サガミマンジ群集付近の海底を観察。多くのサガミマンジが水管だけを出している。

＊投棄された菓子袋の表面に多数の卵塊を発見、マニュピレータで回収。

＊午後のダイブで時間が必要なので早めに調査を切り上げた。

＊10 時 42 分離底。

Track line



Dive Log

NT09-06			Area: Sagami Bay off Hatsushima	28-Apr-09
HPD Dive #		978		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:11	0		着水	

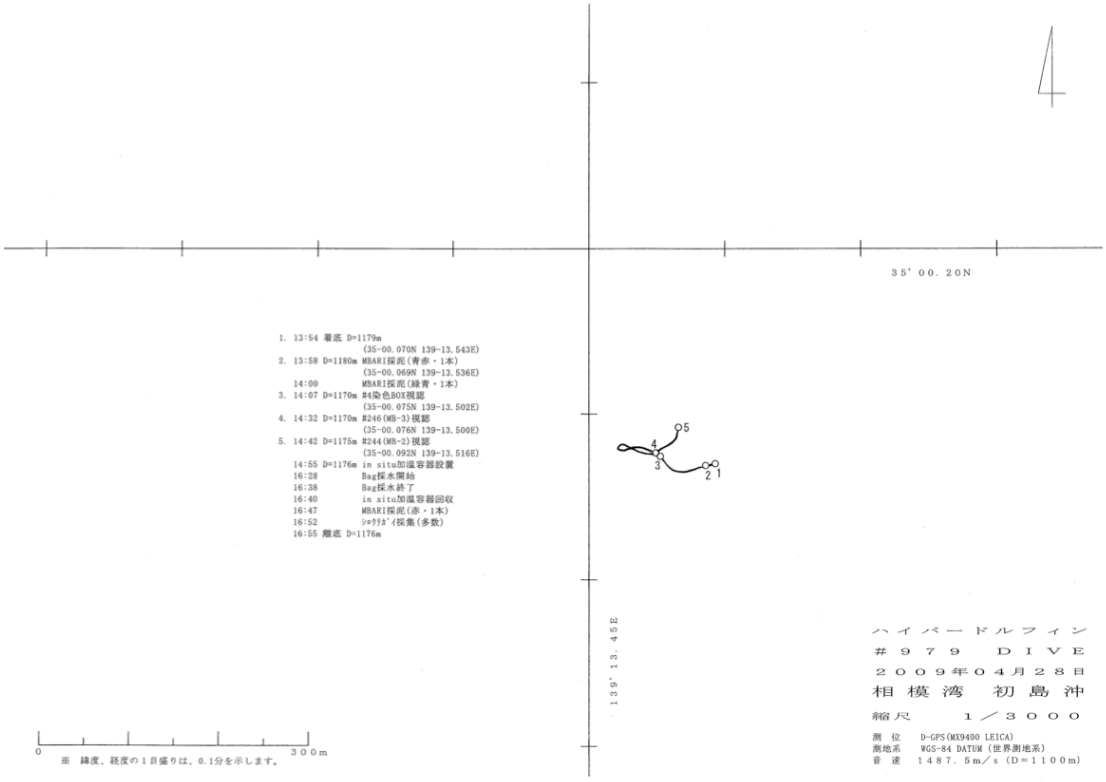
8:22	0		潜航開始	
8:26	77		中層観察開始	
9:01	1179	2．3 m	着底	
9:01	1181		エビ，移動開始	
9:03	1180		カニ	
9:03	1180		エビ２匹	
9:04	1177		魚，カニ	
9:05	1176		ミズムシ	
9:06	1175		カニ２匹	
9:07	1173		カニ３匹，エビ	
9:09	1171		魚，エビ	エビ
9:10	1171		カニ	
9:11	1172		着底	
9:20	1171	0	染色ボックス設置	
9:24	1171	0	染色液ポンプの動作確認	
9:26	1171	0	染色液ポンプ取り付け完了	
9:29	1171	0	染色液ポンプ送液開始	何かの生き物
9:40	1171	0	染色完了	
9:46	1171	0	排水側の蓋完了	
9:53	1171	0	染色ポンプ撤去開始	ソコダラ
9:54	1171	0	ソコダラ	
9:56	1171	0		ゲンゲ
9:57	1171	0		ゲンゲ
9:59	1171	0	染色ポンプ撤去，蓋完了	
10:00	1171	0	魚，ゲンゲ	魚，ゲンゲ
10:01	1171		MBARI　コア採取（赤）	
10:03	1171	0	着底	
10:05	1171	0	スラープガンによりシロウリガイ採取	ウナギ？
10:08	1171	0	シロウリガイ採取完了	
10:09	1171	0	離底　移動	カニ，ウナギ
10:12	1169	0.5	着底	
10:13	1169	0	MBARI　コア採取（黄）	
10:16	1169	0	MBARI　コア採取（黄）完了	
10:17	1169	0	離底　移動	
10:22	1178	2	移動中　海底目視調査	
10:27	1176	1.6	移動中　長期ステーション視認	ソコダラ
10:29	1174	1.2	着底	エビ
10:30	1175	0	MBARI　コア採取（青）	
10:32	1175	0	MBARI　コア採取（青）完了	
10:33	1175	0	スラープガンにより巻貝採取	
10:33	1175	0	海底調査	CMAX 撮影；巻貝，植木鉢
10:38	1175	0	ポテトチップ袋 BOX に回収	
10:40	1175	0	ポテトチップ袋 BOX に回収完了	
10:42	1175	0	離底　　染色液を放出したまま上昇	

4.2.7. Dive #979, 28 April 2009, Off Hatsushima Island, 800-900 m deep site (Toyofuku)

Dive #979, Off Hatsushima Island, 1100m deep site (Toyofuku)
Date: 2009/04/28
Dive site: Off Hatsushima Island Site, Sagami bay
Purpose: 冷湧水域における in-situ 加温容器を用いたシロウリガイ精子･卵の採集･観察のための現場実験、及び冷湧水域の生物、堆積物採集と観察
Dive Summary

- 下降中 HDTV で中・深層生物の観察を行った。
- ＃974　イベント 9 サイト付近、水深 1,179m に潜行した。
- 冷湧水域でない通常の堆積物を確認。有孔虫群集解析用に MBARI コア 2 本を採取。
- 加温実験に適切なサイトを探索。#4 染色ボックスを視認した後、＃974 イベント 8 サイトを経由し，7 サイト付近を移動。
- 適切なシロウリガイ集団を視認し、加温容器を設置。実験容器は下方まで堆積物に覆われ、内部の密閉性は前回実験よりも高かったと考えられる。容器の内部にはシロウリガイ約 15~20 個体が含まれ、小型のイバラガニ類、クモヒトデ類、小型の腹足類を伴う。採取後の確認の結果、これらのシロウリガイ個体には雌雄両方の個体が含まれていた。堆積物、対象生物が落ち着くのを待ち、設置から約 50 分後に照明を入れ現場加温実験を開始した。数分後、加温が原因と考えられる海水の密度差による揺らぎを確認。前回実験の経験では､容器下方が少し開いていたにもかかわらず､水温が約７度程度上昇したことを考慮して、実験中３回にわたって照明の点灯・消灯を繰り返し、加温しすぎないように心がけた。約１時間にわたって実験を行ったが、放精、放卵を視認することはできなかった。容器内の海水を Bag に採水し、加温容器を回収した。回収後、温度ロガーの解析の結果から、容器の内の水温上昇は約２度にとどまっていたことがわかった。
- 加温容器の側部で、堆積物中の化学(硫化水素・pH)プロファイル測定用に MBARI コアー本を採集した。また、加温容器内の生物試料をスラープガンで回収し、実験を終了した。
- 加温実験中、加温容器と同じくらいの大きさのカレイ類が観察カメラの視野を横切り、観察に集中していた研究者を驚かせた。

Dive track



Dive log

NT09-06			Area: Sagami Bay off Hatsushima	28.Apr.09
HPD Dive #		979		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
13:16	0.9		The Dive #979 begins	
13:54	1176	5	Floor in sight: Soft sediment with some white shells around a darl block	
13:55	1180	0	Landing on the deep-sea floor	
13:57	1180	0	Sampling of soft sediment with MBARI Blue-red core	
13:58	1180	0	Sampling ok	
13:59	1180	0	Sampling of soft sediment with MBARI Blue-green core (50 cm away from previous core)	
14:00	1180	0	Sampling ok; Strange fish in sight in the area	
14:02	1177	1.3	ミズムシ	
14:03	1177	1.8	魚	
14:05	1174	1.6	エビ	
14:06	1172	1.5	エビ	
14:06	1172	1.8	エビ	
14:07	1170	1.1	ボックス視認	
14:12	1168	1.6	カニ，エビ，魚	
14:13	1169	0	着底、シロウリガイの様子を観察	
14:14	1169	0	移動	
14:15	1167	1.7	カニ	
14:17	1166	1.6	エビ	
14:20	1165	1.1	クラゲ	
14:22	1164	0	着底、シロウリガイの様子を観察	
14:24	1164	0	銀色の四角いもの	
14:24	1164	0	カニ	
14:24	1164	0	移動	
14:25	1163	2.2	フジツボ岩視認	
14:25	1165	1.5	クラゲ	
14:27	1169	0.8	カニ	
14:29	1168	1	カニ	
14:29	1170	0	着底、シロウリガイの様子を観察	
14:31	1170	0	マーキングボックス視認，移動	
14:32	1170	0	マーキングボックス南側着底	
14:33	1170	0	移動	
14:35	1170	1.9	魚，ウミグモ	
14:35	1171	1.2	エビ	
14:37	1174	0	着底，カニ,	
14:38	1174	0	移動，魚、エビ	
14:39	1173	0.9	魚	
14:40	1173	1.4	ウミグモ・	
14:41	1174	1.4	カニ，エビ，クラゲ	

14:42	1175	0.6	魚，ボックス？視認	
14:43	1176	0	着底、シロウリガイの様子を観察、カニ	
14:44	1176	0	ボックス視認	
14:45	1176	0	魚，移動	
14:47	1176	0	着底、シロウリガイの様子を観察	
14:49	1176	0	加温ボックス設置作業開始	
14:54	1176	0	加温ボックス設置完了，静置	
14:57	1176	0	カニ	
15:01	1176	0	加温ボックス内に小型イバラガニ類	
15:10	1176	0	加温ボックス内にクモヒトデ類	
15:24	1176	0	加温ボックス内に小型の巻き貝	
15:40	1176	0	ボックスのライト ON（加温開始）	
15:52	1176	0	ボックス内ライト OFF（加温停止）	
15:55	1176	0	ボックス内ライト ON（加温開始）	
16:01	1176	0	ボックス内クモヒトデ，ゆっくり動いている	
16:03	1176	0	ボックス内ライト OFF（加温停止）	
16:06	1176	0	ボックスの上，魚（ウナギ？）	
16:07	1176	0	ボックス内ライト ON（加温開始）	
16:15	1176	0	ボックスの中心近くのクモヒトデ，活発な動き，ボックスの端へ	
16:16	1176	0	ボックスの上大型の魚（カレイ類）	
16:23	1176	0	カメラズームアウト，他の場所をズームイン，紙切れ？，すぐに元に戻す	
16:26	1176	0	バックス内右端の貝にズーム，水管	
16:27	1176	0	ミズムシ活発に動く	
16:28	1176	0	海水のサンプリング開始	
16:32	1176	0	採水バック内の水量確認	
16:34	1176	0	カメラ，元の位置へ	
16:38	1176	0	採水バック内の水量確認	
16:38	1176	0	ポンプ OFF	
16:39	1176	0	ライト OFF（加温停止）	
16:40	1176	0	加温ボックス回収	
16:42	1176	0	MBARI コア，加温エリアのすぐ横	
16:45	1176	0	MBARI コア，再度　加温エリア手前	
16:47	1176	0.5	位置を少し移動	
16:48	1176	0	着底	
16:49	1176	0	スラープガン，ボックス設置場所のシロウリガイ採集	
16:52	1176	0	スラープガン終了	
16:53	1176	0	作業終了	
16:56	1176	0.6	離底	

4.2.8. Dive #980, 29 April 2009, Off Hatsushima Island, 800-900 m deep site (Fontanier)

Date: April 29, 2009

Site: 800-900 m site of seep community, off Hatsushima Island in Sagami Bay

Purpose:

(1) In situ box for growth rate estimation in Calyptogena colony

(2) Sediment sampling with MBARI cores

(3) Animals sampling with suction sampler around plankton sampler point
(4) Recovery system of plankton sampler

Dive Summary

- 8:12 – Launching
- 8:25 – Beginning of the dive.
- 9:05 – Oil problem is detected in ROV. ROV is going up.
- 9:19 – Surfacing.
- 9: 31– ROV on the deck for technical adjustments

4.2.9. Dive #981, 29 April 2009, Off Hatsushima Island, 800-900 m deep site (Fontanier)

Site: 800-900 m site of seep community, off Hatsushima Island in Sagami Bay
Landing: Time 11:34 Lat 35°00.946' N, Long 139°13.251' E, Depth 810 m
Leaving: Time 13:34 Lat 35°00.959' N, Long 139°13.334' E, Depth 855 m
Purpose:

(1) In situ box for growth rate estimation in Calyptogena colony
(2) Sediment sampling with MBARI cores
(3) Animals sampling around plankton sampler point
(4) Recovery system of plankton sampler

Dive Summary

- 10:56 – Launching
- 11:07 – Beginning of the dive
- 11:34 – Landing
- 11:52 – Installation of in situ box for growth rate estimation
- 12:51 – Animal samplings with steal-hand
- 13:00 – Animal samplings with ROV-arm
- 13:03 – Animal samplings with suction sampler
- 13:13 – Animal samplings with suction sampler
- 13:22 – MBARI Blue sampling
- 13:23 – MBARI Yellow sampling
- 13:25 – MBARI Red sampling
- 13:32 – Recovery of plankton sampler
- 13:34 – Leaving
- 14:00 – Surfacing

Sampling and Marker Points

No.	Item	Time (JST)	Latitude	Longitude	Depth (m)
1	ROV Landing	11:34	35°00.946' N	139°13.251' E	810
2	In situ box n°1 for growth rate estimations is identified	11:36	35°00.947' N	139°13.240' E	805
3	In situ box for growth rate estimations	11:52	35°00.946' N	139°13.236' E	805
	/ Staining procedure begins	11:55	35°00.946' N	139°13.236' E	805
	/ Staining procedure ends	12:29	35°00.946' N	139°13.236' E	805
4	Animals (Calyptogena) sampling with steal-hand (kumade)	12:51	35°00.951' N	139°13.334' E	858
5	Animals (tube worm) sampling with ROV	13:00	35°00.951' N	139°13.334' E	858
6	Animals (mussels) sampling with suction sampler	13:03	35°00.951' N	139°13.334' E	857
7	Animals (Calyptogena) sampling with suction sampler	13:13	35°00.951' N	139°13.334' E	857
8	MBARI core – Blue	13:21	35°00.959' N	139°13.334' E	854
9	MBARI core – Yellow	13:23	35°00.959' N	139°13.334' E	854

10	MBARI core – Red	13:25	35°00.959' N	139°13.334' E	854
11	Recovery of plankton sampler	13:32	35°00.959' N	139°13.334' E	855
12	Leaving	13:34	35°00.959' N	139°13.334' E	855

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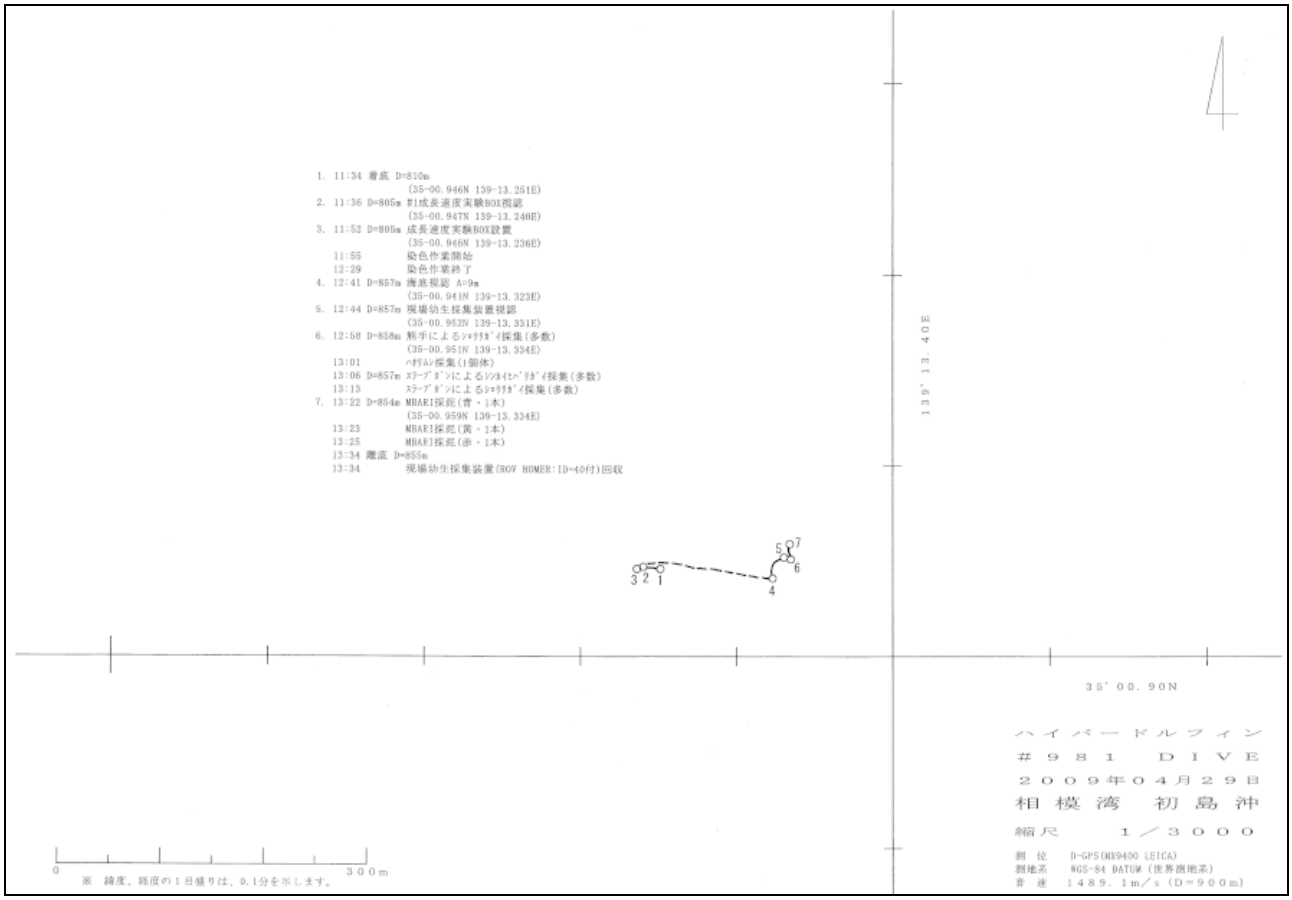
Track line



Video Log

NT09-06 Area: Sagami Bay off Hatsushima 29.Apr.09

HPD Dive # 981

Time	Depth	Alt.	HDTV Camera Remarks(+CCD)
11:41	804	0.8	青染色装置周辺着底
11:42			カニ，魚
11:43			離底
11:43	804		着底，位置再調整
11:44	804		カルセイン染色装置設置開始
11:45	805	0.5	カニ移動待ち
11:46	805	0.5	貝観察
11:47	805	0.5	エビ
11:48	805	0.5	魚（ソコダラ？
11:48	805	0.5	魚（ほそながい）
11:50	805	0.5	染色装置設置完了
11:51	805	0.5	設置状況確認 設置状況拡大確認
11:53	805	0.5	染色液導入準備
11:54	805		染色液排出確認 動作 OK
11:55	805		薬液輸送管接続
11:55	805		ポンプオン 薬液流入確認
12:10	805	0.7	薬液残量確認
12:13	805	0.7	古い方のボックス確認

12:15	805	0.7	薬液残量確認
12:18	805	0.7	染色装置の栓準備
12:20	805	0.7	薬液残量確認
12:22	805	0.7	染色装置　栓完了
12:28	805	0.7	薬液輸送管取り外し
12:32	805	0.7	染色装置栓（ポンプ側）完了
12:33	805	0.5	染色装置　押し込む
12:34	805	0.5	染色完了
12:34	803	2.3	離底
12:35	803	2.3	移動開始
12:41	857	7.2	移動停止
12:43	857	2.3	カニ
12:44	857	3.5	シロウリガイコロニー確認
12:44	856	1.4	ヒバリガイコロニー確認
12:45	857	0.7	着底
12:47	857	0.5	シロウリガイ採集　　熊手　準備
12:48	857	0.5	MBARI コア（赤）移動
12:50	857	0.5	シロウリガイ採集　　熊手　開始
12:51	857	0.5	シロウリガイ採集　　熊手　挿入
12:51	857	0.5	シロウリガイ採集　　熊手　泥ごと採集
12:52	857	0.5	シロウリガイ採集　　熊手　二回目挿入
12:52	857	0.5	シロウリガイ採集　　熊手　二回目すくい上げ
12:54	857	0.5	シロウリガイ採集　　熊手　三回目挿入
12:54	857	0.5	シロウリガイ採集　　熊手　三回目すくい上げ
12:55	857	0.5	シロウリガイ採集　　熊手　４回目挿入
12:55	857	0.5	シロウリガイ採集　　熊手　４回目すくい上げ
13:55	857	0.5	シロウリガイ採集ボックス完了

4.2.10. Dive #982, 30 April 2009, Off Hatsushima Island, 1100 m deep site (Hori)

Date: April 29, 2009
Site: 1100 m site of seep community, off Hatsushima Island in Sagami Bay
Landing: Time 16:27 Lat 35°00.073’ N, Long 139°13.522’ E, Depth 1179 m
Leaving: Time 17:57 Lat 35°00.188’ N, Long 139°13.463’ E, Depth 1176 m

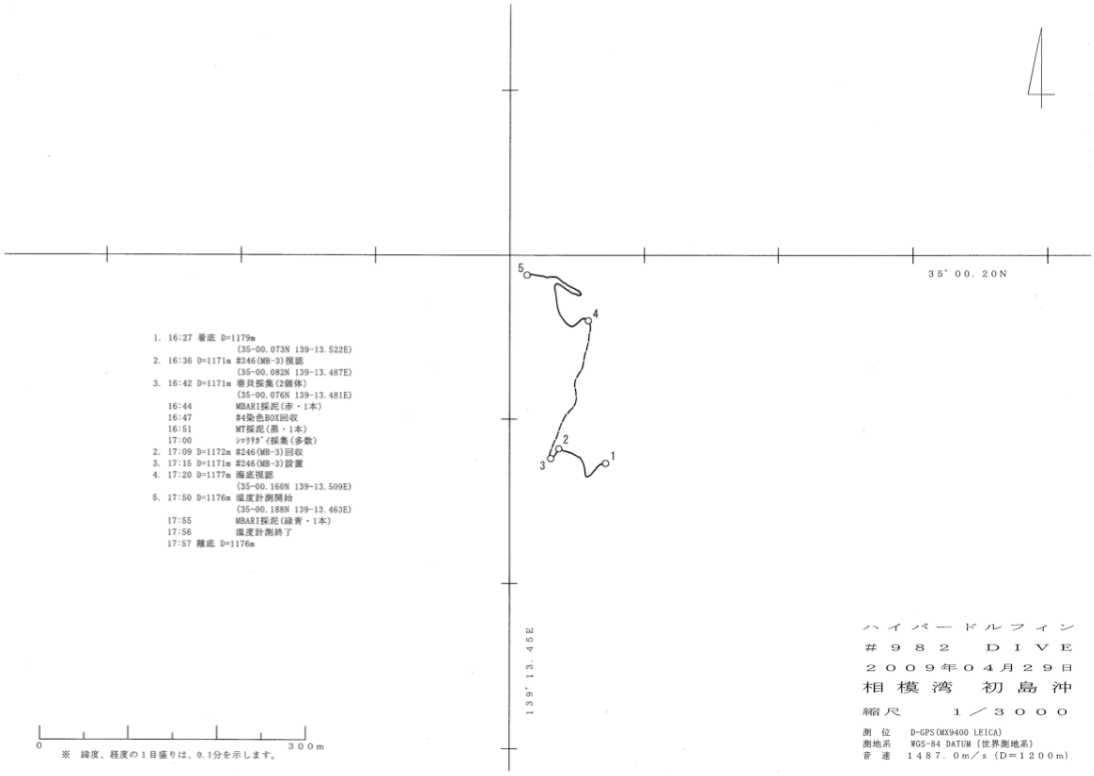
Purpose:

(1) Deployment of in situ staining system.
(2) Recovery of #979 in situ in situ staining system
(3) Sediments sampling using MBARI cores in #979 in situ staining system
(4) Calyptogena sampling using suction sampler in #979 in situ staining system
(5) Sediments sampling using MBARI cores
(6) Animals sampling using scoop sampler system

Dive Summary

- 15:46 – 潜航開始
- 16:27 – 着底
- 16:41 – ソウヨウバイ スラープガンで採集
- 16:44– MBARI コア（赤）採取
- 16:47 – #979 現場染色ボックス回収
- 16:50– MT コア採取
- 16:51 – #979 現場染色ボックス下のシロウリガイをスラープガンで採集
- 17:08 – 昔の染色ボックス回収
- 17:14 – マーキングボックス設置
- 17:43 – 初島ステーション視認
- 17:50 – 水温計測開始（２分間　土の真上計測）
- 17:52 – 水温計　設置（土中）
- 17:56 – MBARI コア（緑）採取
- 17:56 – 水温計測完了（土中）
- 17:58 – 離泥

Dive Track



Video Log

NT09-06 HPD Dive # 982			Area: Sagami Bay off Hatsushima 29.Apr.09	
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
15:46			潜航開始	
15:52	99		クラゲ視認	
15:54	142		クラゲ視認	
16:02	322		魚の群れ視認	
16:12	673		クラゲ視認	
16:14	710		カイアシ類，アミのよう	
16:17	810		赤いエビ	
16:22	1034		赤いエビ	
16:25	1128		クラゲ多数	
16:27	1179	2	着底	
16:27	1177	2.5	ソコダラ	
16:28	1177	1.4	赤いエビ	
16:31	1175	2.7	カニ	
16:32	1175	1.8	岩場にカニ，底にカニ	
16:33	1175	1.6	魚	
16:34	1175	2.3	魚，ウナギ？	
16:35	1172	1.5	魚２匹ウナギ？	
16:36	1172	1.5	染色ボックス，昔のやつ？	
16:37	1170	1.6	染色ボックス	
16:38	1171	0	染色ボックスクローズアップ	
16:41	1170	0	巻き貝２個（ソウヨウバイ）スラープガン	
16:44	1711	0	MBARI コア（赤），ボックス左横	

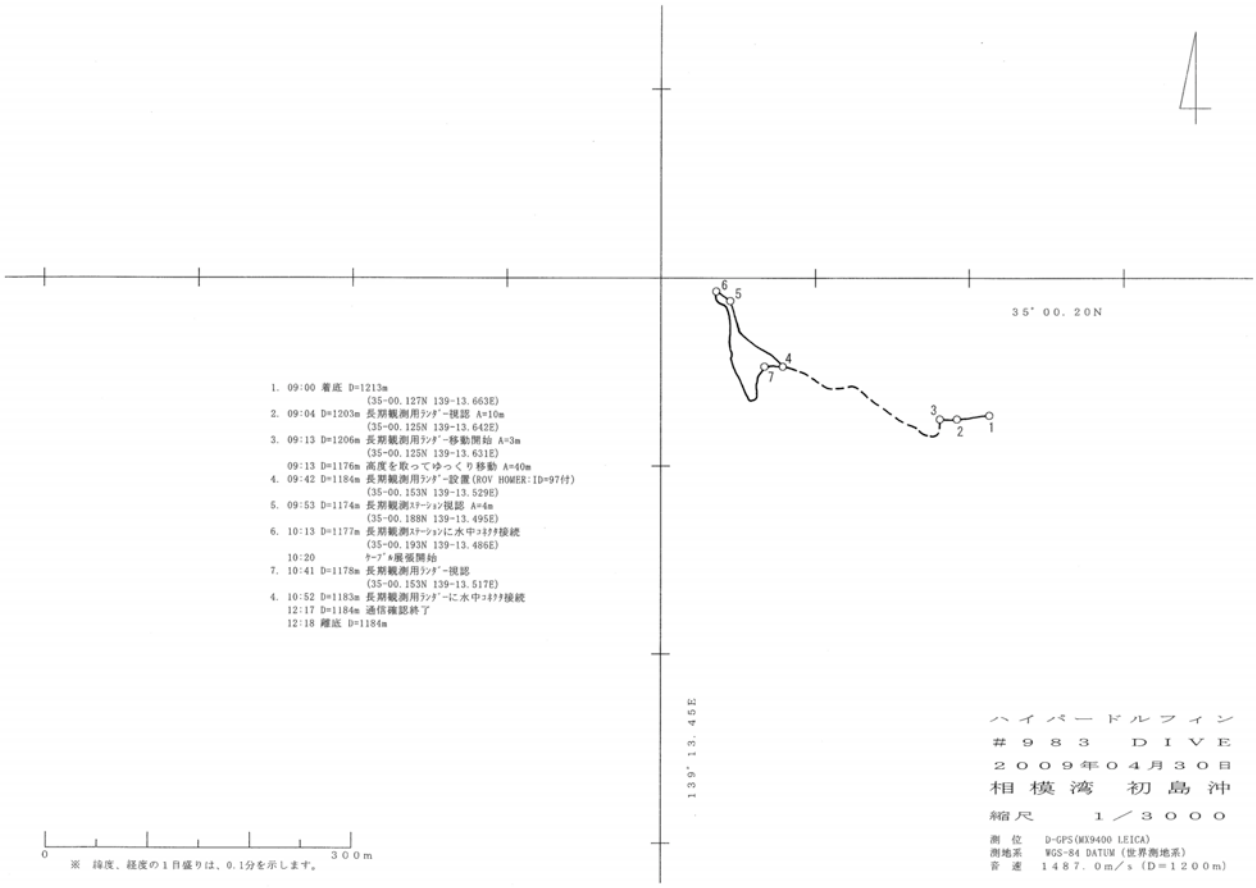
16:46	1171	0	ボックス回収	
16:47	1171	0	ボックス回収完了	
16:48	1171	0	MT コア，ボックス設置後のエリア	
16:50	1171	0	MT コア回収完了	
16:51	1171	0	スラープガン，ボックス設置後のエリア	
16:55	1171	0	一旦停止，視認	
16:56	1171	0	再始動	
16:59	1171		スラープガン終了	
17:06	1172	0	魚ギンザメ？	
17:08	1172	0	マーキングボックス（昔の染色 BOX）回収	
17:09	1172	0	移動	
17:10	1172	0	着底　マーキング位置確認	
17:14	1171	0	マーキング BOX 設置	
17:15	1171	0	移動	
17:23	1174	0	移動　海底観察	
17:26	1174		シロウリガイコロニー	
17:37	1179	0	着底　目視調査	
17:38	1179	0	カニ	
17:42	1178	0	移動	
17:43	1177	1.5	ステーション確認	
17:45	1175	1	移動	
17:46	1175	0	着底　植木鉢マーカー確認	
17:50	1176	0	水温計測開始（２分間　土の真上計測）	水温計，生物
17:52	1176	0	水温計　設置（土中）	
17:52	1176	0	MBARI コア（緑）採取	
17:55	1176	0	MBARI コア（緑）採取　完了	
17:56	1176	0	水温計計測終了	
17:58	1176	0	離底	

4.2.11. Dive #983, 30 April 2009, Off Hatsushima Island, 1100 m deep site (Oguri)

ダイブの場所：模湾・初島沖、水深 1183m
観察：小栗一将
ダイブの目的：
（1）　二次元酸素オプトードを搭載したランダーシステムの設置
（2）　観測の開始を見守る
ペイロード：
100m の海底ケーブルを巻いたリール 1 式

観察結果：

時間	水深	イベント
6:45	0	ランダー投入 33m/分で降下
7:10	890	降下速度 40m/分に増加
7:17	1200	ランダー着底
9:00	1213	Hyper 着底
9:04	1203	ランダー視認
9:13	1206	ランダー移動開始
9:42	1184	ランダー設置・長期ステーションに移動
9:53	1174	長期ステーション確認
10:13	1177	水中コネクタを長期ステーションに接続
10:20	1177	ケーブル展長開始
10:41	1178	ランダー視認
10:52	1183	長期観測用ランダーに水中コネクタを接続・陸上局より送電開始
11:05	1183	通電確認
11:20	1183	ハングアップ？次のステップに移行しないため、陸上局から電源再投入
11:59	1183	再立ち上げ成功
12:08	1183	PC 起動確認
12:17	1184	装置観測開始を確認
12:18	1184	Hyper 離底



1. 09:00 着底 D=1213m
   (35-00.127N 139-13.663E)
2. 09:04 D=1203m 長期観測用ﾗﾝﾀﾞｰ視認 A=10m
   (35-00.125N 139-13.642E)
3. 09:13 D=1206m 長期観測用ﾗﾝﾀﾞｰ移動開始 A=3m
   (35-00.125N 139-13.631E)
   09:13 D=1176m 高度を取ってゆっくり移動 A=40m
4. 09:42 D=1184m 長期観測用ﾗﾝﾀﾞｰ設置(ROV HOMER:ID=97付)
   (35-00.153N 139-13.529E)
5. 09:53 D=1174m 長期観測ｽﾃｰｼｮﾝ視認 A=4m
   (35-00.188N 139-13.495E)
6. 10:13 D=1177m 長期観測ｽﾃｰｼｮﾝに水中ｺﾈｸﾀ接続
   (35-00.193N 139-13.486E)
   10:20 ｹｰﾌﾞﾙ展張開始
7. 10:41 D=1178m 長期観測用ﾗﾝﾀﾞｰ視認
   (35-00.153N 139-13.517E)
4. 10:52 D=1183m 長期観測用ﾗﾝﾀﾞｰに水中ｺﾈｸﾀ接続
   12:17 D=1184m 通信確認終了
   12:18 離底 D=1184m

※ 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
#983 DIVE
2009年04月30日
相模湾 初島沖
縮尺 1／3000

測 位 D-GPS(MX9400 LEICA)
測地系 WGS-84 DATUM (世界測地系)
音 速 1487.0m／s (D=1200m)

4.2.12. Dive #984, 30 April 2009, Off Hatsushima Island, 1100 m deep site (Nakamura)

Site: 1100m site of seep community, Off Hatsushima Island, Sagami Bay
Landin : Time 14:54 Lat 35°00.055’ N, Long 139°13.507’ E, Depth 1176m (WGS-84)
Leaving: Time 17:09 Lat 35°00.145’ N, Long 139°13.509’ E, Depth 1184m (WGS-84)

Payload equipment: in situ box for the growth rate estimation, Suction sampler system, Scoop sampler, Sample box, MBARI-type core sampler (3)
Dive Missions: in situ box for the growth rate estimation in Calyptogena colony.
Sediments sampling using MBARI core.
Animals sampling using suction sampler system and scoop sampler.

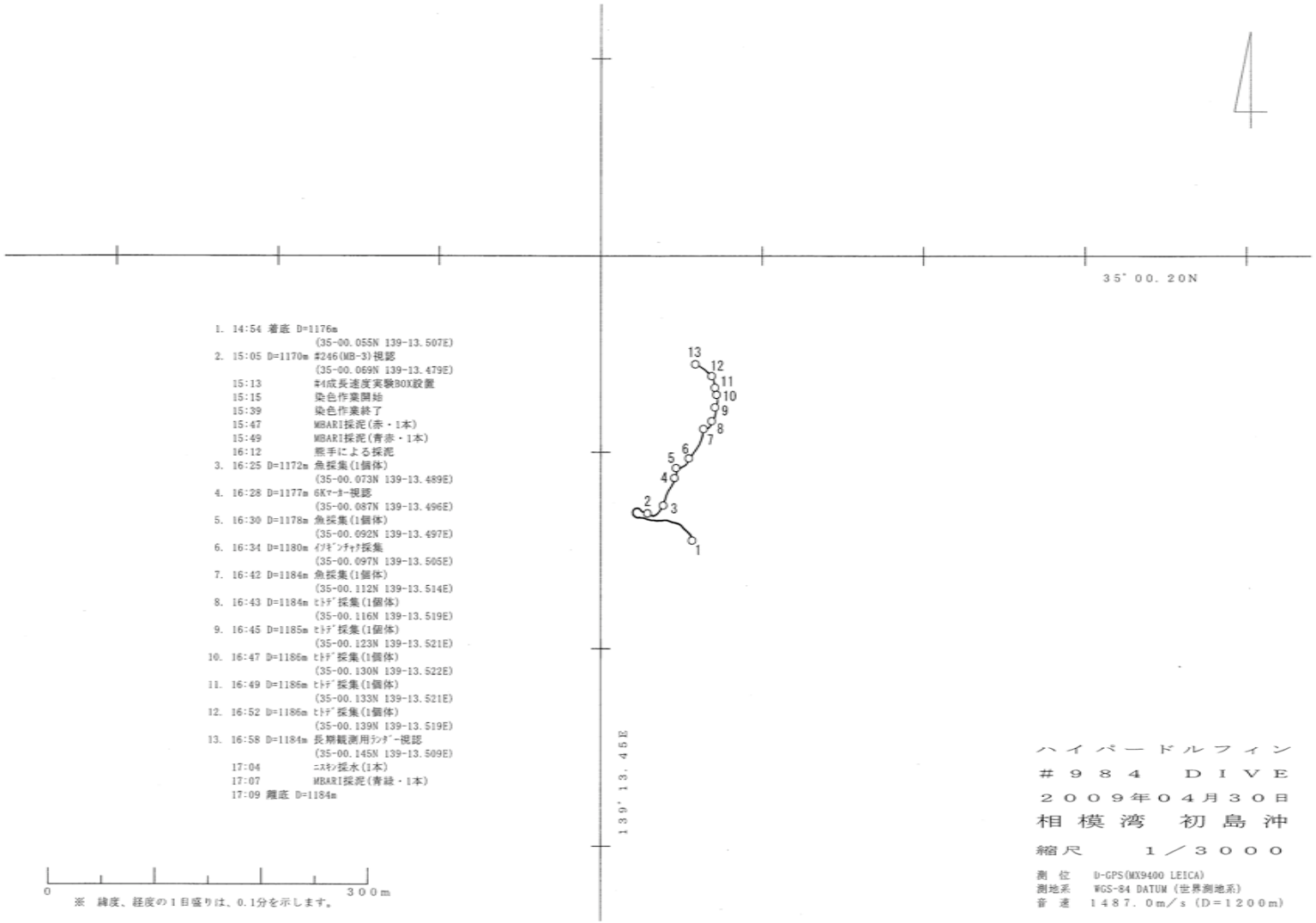
Dive summary

No.	Item	Time (JST)	Latitude	Longitude	Depth (m)
1	HPD landed on the bottom.	14:54	35° 00.055'	139° 13.507'	1176
2	Marking point for in situ staining of Calyptogena shells was found. There were dence about 24 Calyptogenas in the marking point of Calyptogena colony.	15:05	35° 00.069'	139° 13.479'	1170
3	in situ box for the growth rate estimation in Calyptogena colony was placed on the marking point.	15:13	35° 00.069'	139° 13.479'	1170
4	in situ staining were carried out for 24 min.	15:15→ 15:39	35° 00.069'	139° 13.479'	1170
5	Sludge accumulation nearby the Calyptogena colony were collected using MBARI-type core sampler marked with red and blue-red.	15:47→ 15:49	35° 00.069'	139° 13.479'	1170
6	Sludge accumulation on surface 5-10cm layer including the Calyptogena colony were collected using scoop sampler.	16:12	35° 00.069'	139° 13.479'	1170
7	Sampling of animals	16:25→ 16:52			
8	Water sampling using Niskin bottle	17:04	35° 00.145'	139° 13.509'	1184
9	Sludge accumulation were collected using MBARI-type core sampler marked with blue-green.	17:07	35° 00.145'	139° 13.509'	1184
10	Leaving for the surface	17:09	35° 00.145'	139° 13.509'	1184

NT09-06			Area: Sagami Bay off Hatsushima	30-Apr-09
HPD Dive #	984			
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
14:05	0		着水	

14:16	0		潜航開始	
14:25	200		中層観察開始	
14:27	262		クラゲ？	
14:28	288		エビ	
14:29	318			イカ
14:30	355		魚？，イカスミ	
14:31	384		イカスミ	
14:31	396		イカ	
14:32	414			魚
14:33	461		魚	
14:34	470			エビ
14:34	494		クラゲ	
14:38	595			クラゲ
14:39	665		イカ	
14:48	984		クラゲ	
14:49	1031		クラゲ	
14:50	1056		クラゲ	
14:50	1072		クラゲ	
14:52	1148		クラゲ	
14:53	1155			クラゲ
14:53	1162			クラゲ
14:54	1176		海底視認，中層観察終了	
14:55	1174	2.6	エビ	
14:55	1174	1.7	魚	
14:56	1173	2.2		魚
14:57	1172	1.5	魚	
14:58	1172	1.5	エビ	
14:58	1172	1.2	エイ	
14:59	1170	1.7		ウミグモ？
15:00	1169	1.2	ウミグモ，クラゲ	
15:02	1164	2.6	マーカー確認	
15:04	1166	2.1	魚	
15:05	1170	0	着底し，シロウリガイ観察	
15:07	1170	0	シロウリガイを撮影	
15:09	1170	0	染色ボックス設置開始	
15:11	1170	43	設置完了	
15:13	1170	48	染色液放出動作の確認	
15:15	1170	0	染色液放出口の取り付け完了	
15:15	1170	0	染色液放出開始（ポンプ作動）	
15:21	1170	0	染色バック残量を確認	
15:25	1170	0	周囲のシロウリガイを観察	
15:30	1170	0	染色バック残量の確認	
15:33	1170	0	ボックス開口部に栓をする	
15:37	1170	0	染色液放出口を取り外して染色放出終了（ポンプ停止）	
15:39	1170	0	ボックス開口部に栓をする	
15:45	1170	0	MBARI コアを 1 本	

15:47	1170	0	MBARI コアを１本	
15:54	1170	0	熊手で表面堆積物５センチを採取	
16:04	1170	0	場所を移動して，再度熊手で表面堆積物を採取	
16:07	1170	0	再度熊手で表面堆積物を採取	
16:10	1170	0	再度熊手で表面堆積物を採取	
16:17	1170	0	巻き貝（ソウヨウバイ？）スラープガン	
16:21	1170	0	岩をクローズアップ（岩表面にカイメン？）	
16:23	1170	0	魚捕獲失敗，スラープガン	
16:24	1172	0	魚捕獲，スラープガン	
16:29	1175	1.1	６ｋマーカー	
16:29	1177	0.5	カニ，魚，スラープガン	
16:34	1180	0.6	イソギンチャク，岩からはがし採集，スラープガン	
16:37	1183	0	かに，ボックスへ回収，ボックス外へ脱出，スラープガン	
16:42	1184	0.5	魚，スラープガン	
16:43	1184	0	ヒトデａ，ボックスへ回収，スラープガン	
16:45	1185	0	ヒトデａ，ボックスへ回収，スラープガン	
16:46	1186	0	ヒトデａ，ボックスへ回収，スラープガン	
16:48	1185	0	ヒトデｂ，ボックスへ回収，スラープガン	
16:51	1185	0.6	ヒトデｂ，ボックスへ回収，スラープガン	
16:53	1185	0	待機	
16:55	1185	1.4	ランダー付近へ移動	
16:59	1183	0.8	オキアミ？	
17:00	1184	0	ランダー手前１０M着底	
17:04	1184	0	ニスキン採水完了	
17:07	1184	0	MBARI コア採取（緑）	
17:09	1184	0	スラープガンに蓋（？）を装着	
17:10	1184	0	離底　17:11 染色液（黄色）流出開始→表層まで	



1. 14:54 着底 D=1176m
(35-00.055N 139-13.507E)
2. 15:05 D=1170m #246(MB-3)視認
(35-00.069N 139-13.479E)
15:13 #4成長速度実験BOX設置
15:15 染色作業開始
15:39 染色作業終了
15:47 MBARI採泥(赤・1本)
15:49 MBARI採泥(青赤・1本)
16:12 熊手による採泥
3. 16:25 D=1172m 魚採集(1個体)
(35-00.073N 139-13.489E)
4. 16:28 D=1177m 6Kマーカー視認
(35-00.087N 139-13.496E)
5. 16:30 D=1178m 魚採集(1個体)
(35-00.092N 139-13.497E)
6. 16:34 D=1180m イソギンチャク採集
(35-00.097N 139-13.505E)
7. 16:42 D=1184m 魚採集(1個体)
(35-00.112N 139-13.514E)
8. 16:43 D=1184m ヒトデ採集(1個体)
(35-00.116N 139-13.519E)
9. 16:45 D=1185m ヒトデ採集(1個体)
(35-00.123N 139-13.521E)
10. 16:47 D=1186m ヒトデ採集(1個体)
(35-00.130N 139-13.522E)
11. 16:49 D=1186m ヒトデ採集(1個体)
(35-00.133N 139-13.521E)
12. 16:52 D=1186m ヒトデ採集(1個体)
(35-00.139N 139-13.519E)
13. 16:58 D=1184m 長期観測用ランダー視認
(35-00.145N 139-13.509E)
17:04 ニスキン採水(1本)
17:07 MBARI採泥(青緑・1本)
17:09 離底 D=1184m

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
＃９８４　ＤＩＶＥ
２００９年０４月３０日
相模湾　初島沖
縮尺　１／３０００

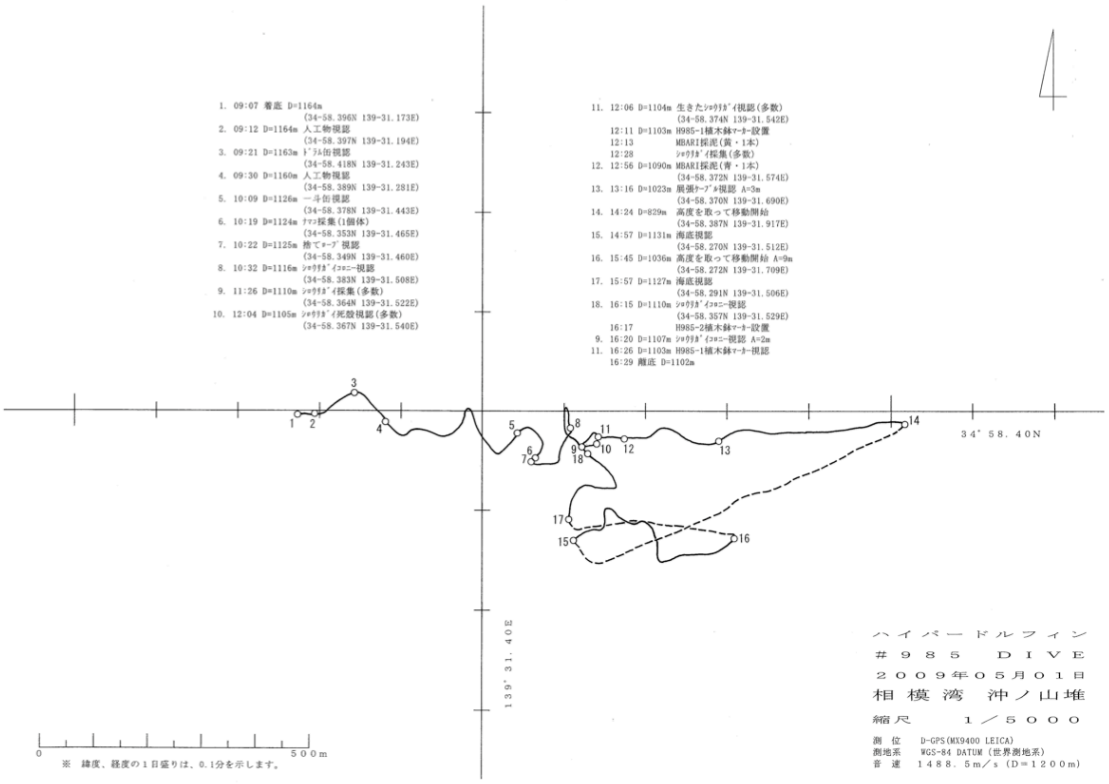
測 位　D-GPS(MX9400 LEICA)
測地系　WGS-84 DATUM (世界測地系)
音 速　１４８７．０m／s (D＝１２００m)

4.2.13. Dive #985, 1 May 2009, Okinoyama Bank (Fujikura)

Date: May, 1, 2009
Chief observer: 藤倉克則
Dive site: Okinoyama Bank site, Sagami Bay.
Purpose: 生物群集の探索と観察
Dive Summary

- 下降中はHDTVで中・深層生物の観察を行った
- 約20年前のドルフィン３Kのシロウリガイ群集位置を対象に潜航．海底は軟泥堆積物に覆われる．シロウリガイの死殻もほとんどなし．スエヒロキヌタレガイの死殻わずか．シロウリガイ群集見つからず．初島沖には見られなかったハゲナマコ多い．
- HPD＃５０６潜航で一度潜航しているサイトに向かう．10：01，1134mあたりからシロウリガイ死殻多くなる．基本的に斜面．
- 10：18，1124m，ハゲナマコ1個体スラープガンで採集，同位体と腸内細菌解析用．
- 10：39，1116mから生きたシロウリガイが出現．11：04 HPD＃５０６マーカー発見．キヌタレガイの死殻が比較的多い．このあたりのシロウリガイ類のパッチは１ｍくらいの小規模パッチ．パッチ内の堆積物の表面は軟泥であるが数cmから粗粒砂や小礫になりコアはきわめて採りにくい．11：25からシロウリガイ類をスラープガンで採集．生きたスエヒロキヌタレが海底上に露出．オシロイエゾボラやハゲナマコがシロウリガイ類パッチ上に散見．シンカイシタダミは生息するが，サガミハイカブリニナとBathyacmaea nipponicaの生きた個体が見あたらない．死殻サンプルは採集できる．
- 12：05，1102mから生貝の大規模なコロニーが出現．数十mの規模．生管のみを露出する小型個体は少ない．マーカー985– 1を設置．ヨコエビ類はコロニー上に多数生息．ライン状にコロニーが分布する場所もある．
- 斜面を登る方向（90度）で走りながら観察．12：44にノーマルな堆積物の採集を試みるが失敗．堆積物中に変色は見られないが数cm下は粗粒砂になる．12：54に再び堆積物採集，このあたりからシロウリガイの死殻なくなる．13：00あたりから斜面で露頭多くなる．
- 斜面岩場にカイロウドウケツ類，小型のウミウチワ型刺胞動物多い．14：03からカイロウドウケツ類とドウケツエビの観察試みるがドウケツエビは確認できない．14：20からウミテングタケの観察，基部にクモヒトデ類がとりつく．
- 水深840m付近まで斜面を観察したが，シロウリガイ類の死殻などは全く見えず，湧水群集が存在する可能性は低いと判断．水深1140m付近までもどり再び湧水群集域の探索を行う．水深1120mあたりから死殻多くなる．先の群集域を結ぶライン上に断層があると推定できた．

Track Line



Video Log

NT09-06 Area: Sagami Bay off Hatsushima 1.May.09

HPD Dive # 985

Time	Depth	Alt.	HDTV Camera Remarks(+CCD)
8:10			着水
8:21			潜航開始
8:33	264		クラゲ
8:34	294		魚
8:50	698		クラゲ
8:50	719		魚？
9:07	1155		赤い多毛類？
9:08	1165		着底
9:08	1166		ソナー反応探索開始，魚
9:09	1166		エビ，カニ，漂着物視認
9:10			ゴミ視認
9:12			土管？人工物視認
9:13	1165		アナゴ
9:18	1164		カイメン，イソギンチャク視認
9:19	1163		魚
9:21	1162		ドラム缶，魚視認
9:23	1163		キヌタレガイ死骸視認
9:24	1162		イソギンチャク
9:25	1161		アナゴ
9:26	1162		二枚貝貝殻視認

9:29	1161		カレイ視認
9:30	1160		シロウリガイの死骸，人工物視認
9:31	1160		ヒトデ，魚，アナゴ，カイメン，人工物視認
9:34	1158		丸く白い貝殻，魚視認
9:35	1157		ナマコ
9:36	1156		点々と白い貝殻
9:37	1156		空き缶視認
9:37	1156		アナゴ
9:39	1154		カニ，白い貝殻
9:40	1153		割れ白い貝殻
9:43	1149		ナマコ？
9:44	1147		点々と白い貝殻
9:45	1147		シロウリガイ貝殻
9:45	1146		ビニール袋
9:47	1145		シロウリガイ貝殻が増えてきた
9:48	1145		魚？
9:49	1145		カニ　　魚
9:50	1143		魚
9:51	1141		魚
9:53	1140		立っている（！）ナマコ
9:56	1189		ソコダラ 魚
9:57	1137		
9:58	1135		イソギンチャク，ナマコ
10:01	1133	0	シロウリガイ貝殻
10:04	1131	0.6	魚
10:05	1129	1.3	魚 x 2
10:06	1129	1.3	魚，くらげ
10:07	1128	0.9	魚
10:08	1127	1	魚，イソギンチャク
10:09	1127	0.9	一斗缶，ナマコ，魚
10:12	1123	1.4	魚
10:14	1121	1.1	ナマコ，魚
10:15	1121	0.6	ナマコ大
10:16	1120	1.6	イカ小，なまこ x 2，魚
10:18	1122	1.3	ナマコ捕獲，スラープガン
10:19	1123	1	ナマコ
10:20	1124	0	岩の周りにワイヤーロープ，靴,
10:24	1122	1.3	クラゲ
10:26	1119	0	ゴミ
10:27	1119	0	魚，赤い海老
10:28	1117	0.5	ナマコ
10:29	1116	0	魚
10:31	1114	0	ロープ
10:31	1114	0	シロウリガイコロニー発見貝殻ばかり，かに，ヒトデ
10:34	1116	0	シロウリガイ，生きているコロニー，二カ所，巻き貝
10:35	1116	0	巻き貝
10:37	1116	0	生きているコロニーの手前に移動
10:38	1115	0	コロニーの横，巻き貝殻

10:43　1115　0　　移動開始
10:44　1115　0.5　　ヒトデ，蟹
10:49　1115　0.5　　岩の側にカレイ
10:51　1114　1.3　　斜面に蟹
10:52　1111　2.3　　斜面に沿って少しずつ上がっていく，ハオリムシ
10:54　1104　6.6　　崖から離れ，別の場所へ移動
10:59　1115　0.9　　魚
11:00　1114　0.6　　魚
11:01　1112　0.6　　魚　　クラゲ
11:02　1110　0.8　　マーカー（５０６－１），カニ，　着底　　マーカー，　カニ
11:05　1110　0　　マーカー付近シロウリガイ観察　　シロウリガイ様子拡大
11:08　1111　0　　キヌタレガイ　死貝
11:09　1111　0　　離底
11:09　1108　2　　移動
11:09　1111　0　　着底
11:10　1111　0　　シロウリガイコロニー観察
11:15　1111　0　　スラープガン目標視認
11:16　1111　0　　位置調整
11:16　1111　0　　シロウリガイ横の堆積物表面はオリーブグリーン，薄茶，黒がまだらに
11:18　1111　0　　MBARI コア（黄）　１／２ささり　抜けた
11:19　1111　0　　MBARI コア（黄）　再度　失敗
11:21　1111　0　　MBARI コア（黄）失敗　堆積物粘性低い
11:23　1111　0　　魚　　魚，　クラゲ
11:24　1111　0　　位置調整
11:24　1111　0　　スラープガン開始　シロウリガイ採集
11:26　1111　0　　キヌタレガイ視認　位置調整
11:26　1111　0　　キヌタレガイ　スラープガンで採集
11:27　1111　0　　位置調整
11:28　1110　0　　MBARI コア（黄）　シロウリガイコロニー周辺再度　失敗
11:34　1111　0　　クラゲ
11:34　1110　1　　移動
11:36　1110　1　　着底　シロウリガイコロニー観察　巻貝
11:38　1110　0　　シロウリガイコロニー観察
11:39　1110　0　　黒い物（石？）
11:41　1110　0　　巻貝
11:41　1110　0　　巻貝
11:45　1110　0　　位置調整
11:46　1110　0　　シロウリガイコロニー観察
11:47　1110　0　　ナマコ
11:47　1110　0　　位置調整
11:48　1110　0　　スラープガン　黒い物　採集
11:50　1110　0　　シロウリガイ死殻に巻貝（シンカイシタダミ）
11:51　1110　0　　位置調整
11:51　1110　0　　シロウリガイ観察
11:53　1110　0　　シロウリガイの上に巻貝？
11:55　1110　0　　MBARI コア（黄）　シロウリガイコロニー周辺　挿入
11:56　1110　0　　MBARI コア（黄）　失敗
11:57　1107　1.8　　離底

11:57	1107	1.8	カニ
11:58	1109	0	着底　シロウリガイコロニー観察
11:59	1109	0	ヒトデ
12:01	1109	0	イバラカニ
12:03	1107	0.9	離底
12:05	1103	1.3	シロウリガイコロニー発見　ぴちぴち
12:05	1103	1.3	カニ
12:06	1104	0	着底
12:06	1104	0	シロウリガイコロニー観察
12:08	1104	0	シロウリガイ殻表面ヒラムシ？
12:11	1103	0	植木鉢マーカー設置　：フジクラピチピチコロニー
12:13	1103	0.8	MBARI コア（黄）　シロウリガイコロニー周辺　挿入
12:13	1103	0.8	MBARI コア（黄）　回収
12:14	1103	0.8	ゴミ（人工物）視認
12:16	1103	0.8	カニ
12:19	1102	1.8	離底
12:20	1103	0.5	着底
12:22	1103	0.5	スラープガン開始　シロウリガイ採集
12:23	1103	0.5	スラープガン　泥採集
12:25	1103	0.5	スラープガン　詰まる
12:25	1103	0.5	スラープガン　泥採集
12:27	1103	0.5	スラープガン　フィルター詰まり確認
12:31	1103	0.5	魚
12:32	1103	0.5	離底
12:34	1099	1	魚
12:34	1099	1	シロウリガイコロニーとぎれる
12:35	1098	0.5	着底
12:36	1098	0.5	MBARI コア（赤）　挿入
12:38	1098	0.5	MBARI コア（赤）　失敗　蓋とれる
12:39	1098	0.5	MBARI コア（赤）　蓋回収
12:41	1098	0.5	MBARI コア（赤）　筒回収
12:45	1098	0.5	MBARI コア（青）　挿入
12:46	1098	0.5	MBARI コア（青）　回収失敗　中身出るさらさら
12:46	1098	0.5	MBARI コア（青）　再度挿入
12:47	1098	0.5	MBARI コア（青）　回収失敗　中身出す
12:48	1096	1.8	離底
12:48	1097	0.6	着底
12:48	1097	0.6	MBARI コア（青）　再度挿入
12:48	1097	0.6	MBARI コア（青）　回収失敗　中身出す
12:51	1090	1.7	離底
12:53	1090	0	着底
12:55	1090	0	MBARI コア（青）　再度挿入
12:56	1090	0	MBARI コア（青）　回収
12:56	1090	0	ナマコ
12:57	1089	0.9	離底
12:58	1089	0.9	びん
13:00	1083	1.3	holothurian
13:01	1081	1.3	eel fish

13:02 1077 1.6 Hard ground with metal thing?
13:03 1074 2.3 1 Actinia on hard substrate
13:04 1074 1.5 Soft sediment
13:05 1071 1.7 Erratic black blocks (?) or black hardground
13:07 1065 1.5 Black hard ground and 1 eel fish
13:08 1060 1.5 Hard ground + 1 eel fish + edge of the cliff
13:10 1053 2 Leaving the edge of the cliff
13:10 1051 1 1 eel fish
13:11 1049 0 Soft sediment
13:13 1042 3 Black hard ground + white thing (?)
13:15 1028 4 A cable with small white arborescent organisms (gorgonia) attached at the black hard ground
13:17 1021 2 shrimp
13:20 1008 3 Important hard substrate area (black outcrops) + anemon, holothurian, wite arborescent organisms
13:21 999 4 holothurian
13:22 990 4 holothurians
13:24 975 4 Small white arborescent organisms (gorgonia) attached at the black hard ground, holothurian
13:26 964 2 Soft sediment
13:27 959 2.5 Hard substrate and small white arborescent organisms (gorgonia)
13:28 953 2.8 Star fish and holothurian
13:29 947 3.8 Holothurian (and others) attached at a steep slope (hard ground)
13:31 938 3.5 Holothurians and anemon on hard substrate
13:32 929 2 Soft sediment with holothurian - and hard substrate again
13:33 926 1.4 Crab and holothurian
13:34 925 1.6 Soft sediment, burrows
13:35 923 2 ell fish on soft sediment
13:36 919 3 Hard substrate and holothurian
13:38 913 1.5 Pink and white arborescent organisms attached on hard substrate + unknown rounded thing
13:39 904 3.1 1 fish 1 fish
13:40 902 2.9 Strange chaotic surface (with gorgonia)
13:41 900 3.5 1 demersal fish
13:43 895 1.6 eel fish eel fish
13:43 894 1.6 black fish
13:44 892 1.3 Irregular surface; eel fish
13:45 890 1.6 fish (grenadier fish ?)
13:46 886 1.8 Gorgonia (beautifull) on hard ground
13::48 880 1.9 Irregular surface and hard ground covered with white gorgonia (lovely!!!)
13:49 877 2.7 edge of a cliff
13:50 874 1.8 edge of a cliff
13:51 872 1.2 shrimp and soft sediment
13:52 869 1.5 Ophiure dancing in the water
13:53 866 1.7 shrimp and Actinia and eel fish
13:55 863 2 eel fishes
13:56 864 1.3 touching the ground - standing by -

13:58	863	1.2	Ophiures on the floor
13:59	861	2	Wood and gorgonia
13:59	859	2	eel fish, ophiure, gorgonia
14:00	854	1.6	fishes
14:01	850	4	hard substrate
14:02	845	4.4	ホバリング，カイロウドウケツ観察
14:13	845	1.5	観察終了，移動開始
14:15	842	1.3	ナマコ，ヒトデ
14:17	830	2.8	ナマコ複数，ウミテングタケ
14:24	829	3.5	水深１１４０m付近まで下降
14:32	812	97.5	エビ
14:32	809	91.6	エビ
14:34	820	92.5	エビ
14:35	821	61.1	クラゲ
14:37	821	80.7	魚
14:42	820	95.6	クラゲ
14:46	821	83.3	エビ
14:54	1049		クラゲ
14:54	1068		クラゲ
14:55	1081		クラゲ
14:55	1103	33	クラゲ
14:57	1129	7.7	クラゲ
14:57	1131	4	海底視認
14:58	1135	0.6	エビ
14:58	1135	0.5	ウナギ，ゴミ？
14:59	1134	0.5	イソギンチャク？，クラゲ，ウナギ？
15:01	1134	0	ウナギ類
15:01	1134	0	ウナギ類
15:02	1134	0	イソギンチャク類
15:02	1134	0	ウナギ類
15:03	1134	0	ウナギ類
15:03	1134	0	横長の岩石，イソギンチャク類，ウナギ類
15:04	1134	0.5	ウナギ類３尾
15:05	1130	1.7	ウナギ類２尾
15:06	1130	1.1	赤いエビ類
15:06	1129	1.1	ウナギ類２尾
15:07	1126	0	着底して生物を観察
15:09	1128	0.6	場所移動，ウナギ類
15:11	1126	3.5	海底斜面上のシロウリガイを観察したが死骸多い
15:12	1123	3.5	イバラガニ類，ソコダラ類
15:13	1119	2.4	ウナギ類
15:13	1118	4	ギンザメ類
15:14	1120	2.3	ウナギ類
15:16	1124	2.7	ウナギ類
15:16	1122	1.9	ウナギ類
15:19	1113	1.9	ウナギ類
15:20	1110	2.5	ウナギ類，イソギンチャク類
15:22	1105	2.9	ウナギ類

15:23	1105	2.4	ウナギ類２尾，ソコダラ類
15:26	1106	2.2	ウナギ類２尾，イバラガニ類
15:27	1107	3.2	ウナギ類２尾，ヒトデ類
15:29	1106	3.8	ウナギ類２尾
15:30	1096	8.7	崖斜面を上昇
15:32	1088	3.2	イソギンチャク類２尾，ウナギ類
15:33	1078	3	コシオリエビ類
15:34	1034	2.4	イバラガニ類
15:35	1072	2.1	イバラガニ類，ヒトデ類
15:36	1069	1.7	ソコダラ類
15:38	1062	2.6	ウナギ類
15:39	1058	3.1	ナマコ類
15:40	1054	2.4	ソコダラ類
15:41	1051	3	ソコダラ類，ウナギ類
15:43	1044	1.7	ウナギ類
15:43	1045	0	着底して生物を観察が，ナマコ類，ミズムシ類，赤いエビ類
15:45	1040	7.2	少し浮上して場所移動
15:58	1126	3	イバラガニ類
15:59	1122	2.6	クラゲ類
16:00	1124	2	ソコダラ類
16:01	1123	3.2	シロウリガイ類死骸少々
16:02	1117	3.2	ソコダラ類
16:04	1107	3.1	シロウリガイ類死骸少々
16:06	1097	2.7	ヒトデ
16:08	1094	4	ウナギ類
16:08	1090	3.4	刺胞動物
16:08	1087	3.1	カニ
16:10	1086	2.2	ヒトデ
16:10	1090	2.5	クラゲ類
16:12	1102	0.6	シロウリガイ死骸
16:13	1107	1	シロウリガイ死骸？
16:14	1109	0.9	シロウリガイコロニー
16:16	1110	0	着底
16:16	1110	0	シロウリガイ生息確認　植木鉢マーカー（H）９８５－２設置
16:18	1110	0	移動
16:19	1107	1.1	シロウリガイコロニー
16:22	1106	1.3	シロウリガイコロニー　高密度の群集有り
16:25	1101	1.7	シロウリガイコロニー午前中のポイント
16:27	1101	0	スラープガン　シロウリガイと泥を採取
16:29	1101	0	離底

4.2.14. Dive #986, 2 May 2009, Okinoyama Bank (Watanabe)

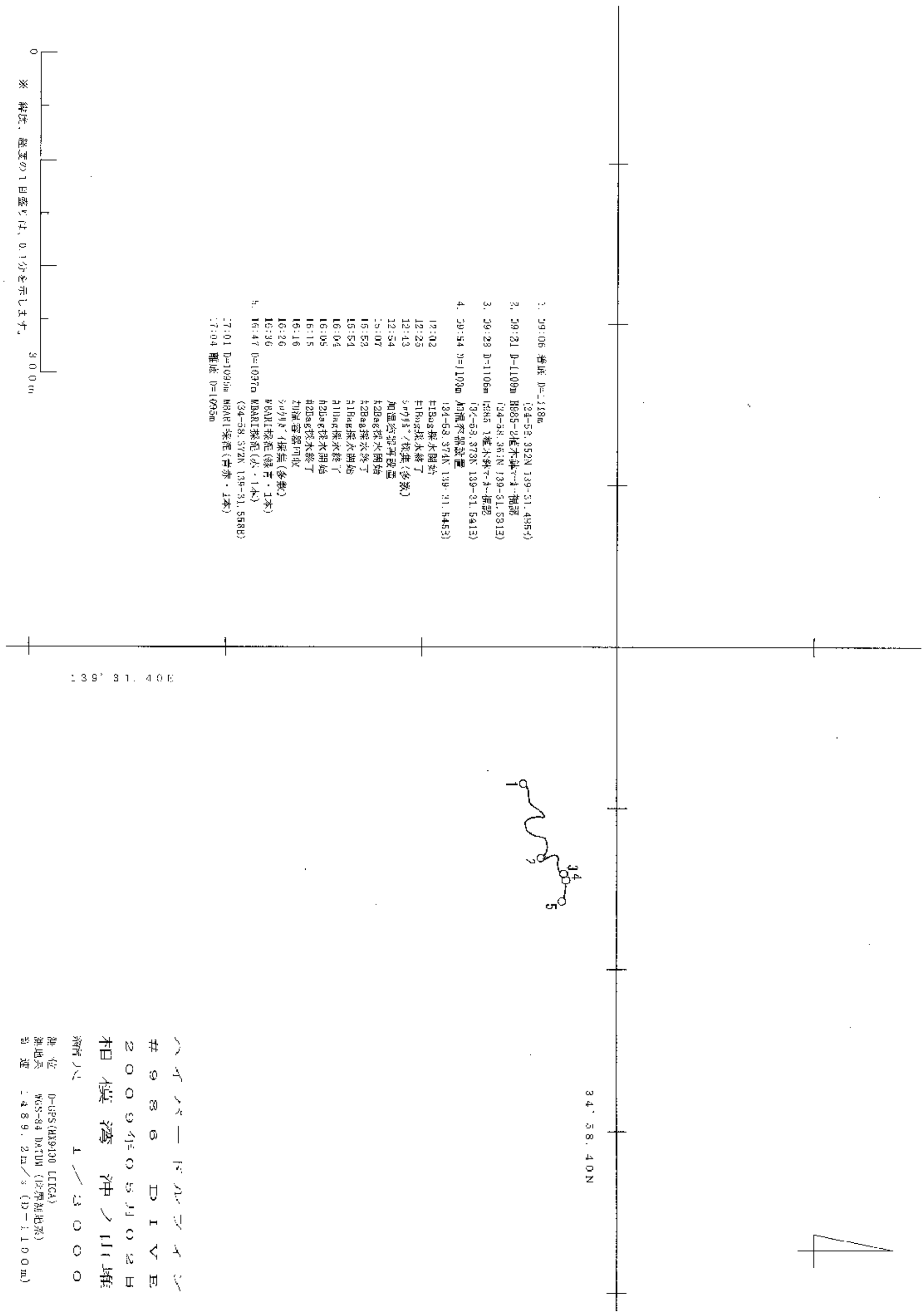
Date: May 02, 2009

Dive site: Okinoyama Bank Sagami Bay

Purpose: 現場加温装置を用いたシロウリガイ類受精卵の採集，生物採集，MBARI 式コアによる採泥.

Dive Summary

- H985-2 マーカー南西の水深 1118m の海底に着底．シロウリガイ類の現場加温実験のため，H985-1 マーカーへと向かう.
- H985-2 マーカー視認．シロウリガイ類の死殻を多数観察しながら通過.
- H985-1 マーカーのシロウリガイ類群集前に着底し，周辺を観察．シロウリガイ類群集内に加温ボックスを設置．ボックス設置後，約 1 時間放置し，加温を開始した．1 時間観察したが，放精，放卵を観察できなかった．念のため，加温ボックス内の採水を行い，揚収後，船上の顕微鏡下で観察することとした．また，加温ボックス内のシロウリガイ類が放卵・放精しなかった理由を確認するため，シロウリガイ類の採集を行った.
- 付近に分布する別のシロウリガイ類群集前に移動し，再びシロウリガイ類の加温実験を行った．加温ボックス設置後，約 1 時間放置し，加温を開始した．1 時間観察したところ，加温ボックス内の個体群が水管を伸ばすなどの行動が観察できた．放精，放卵の準備と信じてさらに約 30 分加温したところ，シロウリガイ類 1 個体が放精している様子を観察できた．さらに 10 分後，別の個体が放卵するのを観察できたため，ボックス内の採水を開始した．採水中も加温を続けていたところ，採水開始から約 20 分後に別の個体の放精を観察した．精子は海水中では沈み，加温ボックス下の隙間からボックス外側へ漏れていく様子が観察できた．また，精子がボックス壁面に付着する様子も観察できた．採水は，約 45 分間行った．揚収後の観察により，採水中には卵が含まれていることが確認できた．シロウリガイ類群集は，約 2 時間半に渡り加温されたことになるが，終始，水管を伸ばすなどの様子が観察できた．加温実験終了後，スラープガンにて加温ボックス内のシロウリガイ類を採集した．シロウリガイ類の多くは，シロウリガイであった.
- MBARI コアにてシロウリガイ類群集直近の採泥（緑青）を行った．底質は砂質でコアの採集は難しい.
- シロウリガイ類群集から離れた海底で採泥（赤）を試みるが，海底下に堅い層があり，表層数 cm しか採泥できなかった.
- さらに離れた海底で採泥（青赤）を試みる．やはり砂質で採泥は難しく，表層数 cm しか残らなかった.
- 水深 1095m の海底にて離底．調査終了.



Video Log

NT09-06			Area: Sagami Bay Okinoyama Bank	2.May.09
HPD Dive#		986		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:15	0		着水	
8:25			潜航開始	

8:35			中層観察開始	
9:06	1117		着底，移動開始	
9:07	1118		ナマコ，魚	
9:09	1115		黒い？魚	HDTV，カメラで丁寧に撮影
9:10	1114		ギンザメ	HDTV，カメラで非常に丁寧に写真撮影
9:16	1113		赤いエビが横切る	
9:18	1120		アナゴ	
9:19	1111		アナゴ	
9:20	1110		＃９８５の植木鉢マーカー視認，アナゴ	
9:22	1109		アナゴ２匹	
9:22	1108		小さな魚	
9:23	1109		５０６のシロウリガイ類コロニー（イベントマーク３番）	
9:23	1109		アナゴ	
9:24	1108		灰色のアナゴ？魚？	魚
9:25	1106		＃９８５－１　植木鉢マーカー視認，シロウリガイ類コロニー観察	クラゲが横切る
9:27	1106		着底	
9:28	1106		シロウリガイ類の死骸が目立つ	
9:32	1103		＃９８５－１植木鉢マーカーの側に着底	
9:32	1104		シロウリガイ類の写真を丁寧に撮影，大きな魚	
9:37	1104		シロウリガイ類の間に小さな魚（稚魚）	
9:38	1104		加温ポックス準備開始　①	
9:44	1104		加温ボックスの設置①　失敗	ソコダラ
9:47	1104		アナゴ２匹	
9:48	1104		植木鉢マーカー移動	
9:49	1103		移動，別のターゲットを探す	
9:52	1104		シロウリガイの写真を丁寧に撮影	
9:53	1104		加温ポックス準備開始　②	
9:54	1104		加温ポックス設置　②完了，写真撮影，落ち着かせるため放置開始	
10:59	1104	0.6		魚
11:00	1104	0.6	加温開始	
11:03	1104	0.6	堆積物から水が噴き出す　水管から排水？	
11:04	1104	0.6	真ん中の個体が水管を展開	
11:05	1104	0.6	左上の個体の水管を動いた	
11:07	1104	0.6	ゴカイが堆積物中から顔を出した	
11:10	1104	0.6	左上，真ん中，右の個体の水管が少し閉じられた	
11:14	1104	0.6	視野修正	
11:16	1104	0.6	左の個体が黒い粘液様の物質を吐出	
11:53	1104	0.6	ウロコムシ移動	
11:54	1104	0.6	ゴカイ泥から出てくる　口開ける	
11:54	1104	0.6		魚
11:56	1104	0.6	左端の個体水管を出し泥を吐く	

11:57	1104	0.6	ゴカイ穴に戻る	
11:59	1104	0.6		魚
12:00	1104	0.6	No.1 バッグ採水器(緑)ポンプ　準備	
12:02	1104	0.6	ポンプ　オン　採水開始	
12:10	1104	0.6	採水確認　　ホースねじれ？	
12:13	1104	0.6	袋ふくらまない	
12:16	1104	0.6	少しふくらむ？	
12:22	1104	0.6	バッグ確認	
12:25	1104	0.6	ポンプ　オフ　採水終了	
12:27	1104	0.6	加温ボックス　位置をずらす	
12:29	1104	0.6	MBARI コア（青赤）位置をずらす	
12:30	1104	0.6	サンプルボックス蓋開ける	
12:31	1104	0.6	熊手用意	
12:33	1104	0.6	加温ボックスたおれる	
12:34	1104	0.6	加温ボックス位置をずらす	
12:34	1104	0.6	熊手　加温した　シロウリガイ類採集	
12:36	1104	0.6	ボックスにいれる	
12:37	1104	0.6	熊手　加温した　シロウリガイ類採集二回目	
12:38	1104	0.6	ボックスにいれる	
12:39	1104	0.6	熊手　加温した　シロウリガイ類採集三回目	
12:41	1104	0.6	ボックスにいれる	
12:41	1104	0.6	熊手　泥採集	
12:42	1104	0.6	ボックスにいれる	
12:43	1104	0.6	採集完了	
12:44	1104	0.6	熊手収納	
12:45	1104	0.6	加温ボックス　持ち上げる	
12:45	1104	0.6	カニ	
12:47	1103	0.5	加温ボックス準備開始③	
12:51	1103	0.5	加温ポックス設置　③　埋め気味	
12:55	1103	0.5	写真撮影　放置開始	
12:57	1103	0.5	ボックスの中に魚	
13:00	1103	0.5	Experimental box still in position, waiting for 13:40	
13:22	1103	0.5	A crab with a dead fish in its pick-ups (pinces in french)	
13:35	1103	0.5	A crab walking	
13:38	1103	0.5	Zoom on clams outside the box - siphons visible	
13:40	1103	0.5	Light is switched on - a creeping worm	
13:51	1103	0.5	Suspect whitish smoke around one clam.	
13:54	1103	0.5	A jelly fish floating …	
14:01	1103	0.5	シロウリガイ類がもぞもぞと少し動く	
14:05	1103	0.5	ボックス内にヨコエビ複数	
14:08	1103	0.5	ボックス外にヨコエビ	
14:12	1103	0.5	ボックス外にクモヒトデ	

14:25	1103	0.5		クラゲ
14:27	1103	0.5	ボックス外にクモヒトデ複数	クモヒトデ複数
14:35	1103	0.5	シロウリガイ類が水管を少し動かす（伸ばしている？）	
14:40	1103	0.5	シロウリガイ類の水管から泥？	
14:45	1103	0.5	シロウリガイ類が水管を少し動かす	
14:46	1103	0.5	ボックス内に多毛類登場	
14:50	1103	0.5	シロウリガイ類が水管を少し動かす（広げ気味）	
14:55	1103	0.5	シロウリガイ類が水管を動かし放精？	
15:00	1103	0.5		クラゲ
15:06	1102	0.5	シロウリガイ類が卵を放出	
15:07	1102	0.5	ボックス内の海水をポンプで吸い取り開始(No.2 バッグ)	
15:28	1102	0.5	シロウリガイ類が放精	
15:39	1102	0.5	採水バッグ(No.2)確認	
15:43	1102	0.5	ポンプ停止して作動確認(フラッシュ)	
15:44	1102	0.5	再度 No.2 バッグに採水開始	
15:50	1102	0.5	採水バッグ確認	
15:52	1102	0.5	ポンプ停止	
15:53	1102	0.5	採水バッグ No.１に切り替え作業	
15:54	1102	0.5	採水開始	
16:04	1102	0.5	採水バッグ No.１　採水終了	
16:05	1102	0.5	採水バッグ No.２に採水開始	
16:15	1102	0.5	採水バッグ No.２　採水終了	
16:17	1102	0.5	加温ボックス回収	
16:21	1102	0.5	植木鉢マーカーH985-1 再設置	
16:23	1102	0.5	加温ボックス中にあったシロウリガイ類をスラープガンにより採集開始	
16:26	1102	0.5	シロウリガイ類をスラープガンにより採集終了	
16:36	1102	0.5	加温実験付近の泥　MBARI コア（緑青）採取	
16:40	1102	0.5	移動	
16:44	1096	0.5	着底	
16:47	1096	0.5	MBARI コア（赤）採取	
16:49	1096	0.5	移動	
16:50	1095	0.5	着底	
17:01	1095	0	MBARI コア（青赤）採取	
17:04	1095	0	離底	

4.2.16. Dive #987, 4 May 2009, Off Hatsushima Island, 800-900 m deep site (Furushima)

Date: May 4, 2009
Site: 800 – 900m site of seep community, off Hatsushima Island in Sagami Bay
Landing: Time 08:59 Lat 35°00.931' N, Long 139°13.251' E, Depth 819m (WGS84)
Leaving: Time 13:13 Lat 35°00.963' N, Long 139°13.323' E, Depth 853m (WGS84)

Purpose:

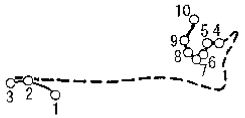
Using "in situ gamete sampler", collect a gamete of Calyptogena in a colony of the vicinity of ADCP.
Using MBARI core sampler, sample Sediment of a Calyptogena colony.
Using scoop sampler and Sample box, collect small Calyptogena.
In addition, using Suction sampler system, Bathymodiolus and animals are collected.
Recovery of ADCP.

Dive Summary

ADCP was recovered. (measurement interval: 5 minutes)
Sediments sampling was carried out with MBARI and MT core sampler.
Organism observation.
Samplings such as Calyptogena specimens using Suction sampler system.
(Note)
ADCP is recovery on May 4.

Track line

1. 08:59 着底 D=819m
(35-00.931N 139-13.251E)
2. 09:05 D=804m #1成長速度実験BOX設置
(35-00.937N 139-13.237E)
3. 09:32 D-805m MBARI採泥(赤・1本)
(35-00.935N 139-13.228E)
09:33 両舷多板って移動開始
4. 09:45 D-857m シロリガイコロニー視認
(35-00.953N 139-13.336E)
5. 09:50 D-854m ハオレン採集(多数)
(35-00.953N 139-13.330E)
09:51 流向流速計視認
6. 09:52 D=854m 1992マーカー視認
(35 00.948N 139-13.328E)
7. 09:57 D-860m シンカイヒバリガイ採集(多数)
(35-00.948N 139-13.325E)
8. 10:02 D-858m シンカイヒバリガイ採集(多数)
(35 00.949N 139 13.320E)
9. 10:19 D-856m 加温容器設置
(35-00.954N 139-13.318E)
11:30 Bag採水開始
11:35 Bag採水終了
11:38 MBARI採泥(赤・1本)
12:45 Bag採水開始
12:49 Bag採水終了
12:57 シロリガイ採集(多数)
12:59 加温容器回収
10. 13:03 離底 D-853m
(35-00.963N 139-13.323E)
13:03 D-853m 流向流速計(RDI HOMER:SD-584付)回収



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
#987 DIVE
2009年05月04日
相模湾 初島沖
縮尺 1／3000

測 位 D-GPS(MX9400 LEICA)
測地系 WGS 84 DATUM(世界測地系)
音 速 1493.0m／s (D=900m)

Video Log

NT09-06			Area: Sagami Bay off Hatsushima	4-May-09
HPD Dive #		987		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:10	0		着水	
8:20	0		潜航開始	
8:24	74		魚の群れ	
8:25	75		中層観察開始	
8:59	818		着底	
9:00	806.2	2.3	移動	
9:05	805.8	1.3	着底	
9:06			カニ	
9:07			魚	
9:08			染色 BOX２つに光をあてる.	
9:09			イバラガニ２匹	
9:10			Box１番が倒れているので戻しに行くために離底	
9:10	804.8	1.2	着底　　Box 周辺にイバラガニが３匹も集まっている	
9:13			Box（番号視認できず）の枠をマニュピレーターの手で地面に押す	
9:15	805.5	0.8	Box１番持ち上げる	
9:19			Box1 番再設置	Box1 の中に魚がサンプリングされている
9:21			Box１番の枠をマニュピレーターの手で地面に押す	
9:23			Box（番号視認できず）の枠をマニュピレーターの手で地面に押す	
9:24	805.2	1.4	MBARI コア採集のために移動	
9:26			着底	
9:27			黒色変色域に水管多数	
9:29			MBARI 青　黒変色域のシロウリガイ死殻の隙間狙う	
9:30			堆積物の表層１ｃｍが岩（岩盤）のため, コアが刺さらなかった	シロウリガイは下が岩ではないところにいる？
			黒変色域のシロウリガイ死殻の隙間を狙い，再度，採泥	
9:32			MBARI 青　採泥終了	
9:33			ADCP の方（イベント１７番）へ移動	ハイビジョンカメラの調子悪い？
9:34	800.8	28.8		小さい魚（ソコダラ）
9:40	850		クラゲ	
9:42		5.7		海底視認
9:42		2.4	魚	
9:43		2.4	魚（ソコダラ？）全身見える　　０９：４２視認と同じ魚	
9:45	856.7		マーカー視認　　シロウリガイコロニーへ移動	
9:46			サガミハオリムシ（Lamerubrakia）視認	
9:46	855.5		着底　　サガミハオリムシ（Lamerubrakia）採集のため	

9:48	856.6	0.5	サガミハオリムシ　4，５本採集　Box にいれる	
9:50			Box しめる	
9:51			ヒバリガイを取りに移動	
9:53	857.3	5.8		魚
9:53			シンカイヒバリガイ類視認	
9:56	860	0.9	着底　　シンカイヒバリガイ類の真正面	殻皮が茶色と黒色の個体がいるので，ヘイトウシンカイヒバリガイとシンカイヒバリガイがいると思われる
9:56			シンカイヒバリガイ類スラープガンで採集開始	
9:57			シンカイヒバリガイ類スラープガンで採集終了	
9:58			離底　　さらなるヘイトウシンカイヒバリガイ採集のため移動	
9:59	858	1.3	ハオリムシ	
10:00	858	1.3	ヘイトウシンカイヒバリガイ発見	
10:00	858	0.9	着底	
10:01			スラープガンでヘイトウシンカイヒバリガイ採集開始	
10:02			スラープガンでヘイトウシンカイヒバリガイ採集終了	
10:04	856	1.9	離底	
10:04	855	1.3	ソコダラ	
10:05	856	0.5	着底	
10:06			元気の良いシロウリガイ発見	
10:07			加温ボックス設置開始	
10:10			漏れ防止のため加温ボックス押さえ込む	
10:11			貝にぶつかるため加温ボックス設置中断	
10:13	855	0.6	場所替えのため離底	
10:14	856	0.6	着底	
10:15	855	0.5	離底	
10:16	855	0	着底	
10:17			ちょうど良さそうなシロウリガイ発見	
10:17			加温ボックス設置開始	
10:18			漏れ防止のため加温ボックス押さえ込む	
10:19			加温ボックス設置完了	
10:20			落ち着かせるため放置開始	
10:21			ADCP 視認	
10:27			ボックス内ゴカイ顔を出す	
10:31			ゴカイ穴から出てくる	
10:38			ボックス内シロウリガイ中央右個体水管出す	
10:41			ボックス内シロウリガイ中央右個体水管伸ばす	
10:43			ボックス外シロウリガイ水管出す	
10:45			加温ボックス　加温開始	
10:49			ボックス外シロウリガイ右端個体水管出す	
11:00			画面右端２個体放精	
11:01			ボックス内右角個体放精	
11:02			ボックス外に漏れ出る	

11:05			放精？　終わり？？	
11:30			ボックスのポンプ　オン	
11:35			ポンプ　オフ　投光器　オフ	
11:36			MBARI コア　赤　ボックスの左横 20cm	
11:38			MBARI コア　赤　採泥終了 長さ１０ cm 未満	
11:39			ボックスを外す	
11:45			ボックスをPayload前面のシロウリガイ群集に被せる	
11:46			ボックスを外して，別の群集の上に被せ直す	
11:52			ボックス押す．12:10 まで待ち	
12:08	855	0	ボックスのすぐ外側	
12:10			ボックス内加温開始	
12:12			ボックス右側のシロウリガイ，水管大きく開く	
12:17			真ん中の貝の表面，ウミグモ二匹動き回る	
12:27			左奥の貝，クローズアップ，閉じている	
12:29			水が濁ってくる，放精？カメラでは確認できず.	
12:36			ウミグモ，ヨコエビ	
12:41			真ん中，左奥の貝，水管を長く出す	
12:45			採水ポンプ始動	
12:48			採水バック確認，ほぼ満タン	
12:49			ポンプ停止，加温ライト停止	
12:50			加温ボックス回収，熊手準備	
12:52			熊手，採泥開始，一回目	
12:54			二回目採泥	
12:56			三回目採泥	
12:59			採泥終了	
13:03			collecting ADCP	
13:05			leave the bottom	

4.2.17. Dive #988, 4 May 2009, NE Off Hatsushima Island, whale fall site (Florence)

Landing: Time: 16:06, Lat: 35☒04.911' N, Long: 139☒13.004' E, Depth: 929 m
Leaving: Time: 18:59, Lat: 35☒04.940' N, Long: 139☒12.970' E, Depth: 917 m
Chief observer: Florence PRADILLON (JAMSTEC)
Purpose: collect bones, sediments, organisms around the 5 months old" Satomi" whale carcass, deploy and recover pig bones.
Payload equipments:

1. Suction sampler with Multi-canister and single canister 1
2. Sample box (syntactic foam) 1
3. Small sample box 2
4. MBARI corer 3
5. Niskin bottle 2
6. Pig bone parcels (H988-1, H988-2) 2

Dive summary

A rib was collected from the 5-months old " Satomi whale" , as well as 3 MBari cores, 2 plankton samples and 2 water samples. 1 pig bones parcel was deployed (H988-1) and one pig bone parcel was recovered (H930-4).

Dive report

・ Observation of the " Satomi" whale after 5 months

Before arriving close to the carcass (within 50 m), we observed several rattail fishes. The sediments surrounding the carcass were covered with white bacterial mats (?) over several meters. Most of the bones were naked, except for the head part where the spermaceti was still abundant. Osedax were observed at the base of the skull (back side), on the top posterior part of the upper jaw bone, and on some of the ribs (figure 1). Video and still images, with panoramic and close-up views were taken over the whole length of the body, but only one side was accessible for the ROV.

Figure 1. " Satomi whale" after 5 months. Osedax has colonized some ribs, the posterior part of the upper jaw, and the back part of the skull (right picture).

・ Larval collection

Water filtration was conducted using the suction sampler with two canisters that were designed for small plankton collection (50 μm mesh-size). Canister 1 was collected about 20 cm above the sediment, about 1-2 meters away from the carcass (flowmeter canister 1: 372399-376881). Canister 2 was collected at 10-20 cm from skull where Osedax are growing, 40-50 cm above the bottom (flowmeter canister 2: 376881-380783). A preliminary analysis of

these samples was conducted: copepods, ostracods, chaetognaths, foraminiferans, juvenile and larvae of polychaeta were found (fig).

・ Whale Bone Collection

1 rib with Osedax growing on one end was collected. This bone was too long to fit into the largest collection box, and had to be brought back on board with the lid open. About 30 Osedax were observed on it, but their condition was not very good. The species seems to be similar to O. roseus.

・ Pig Bone deployment

1 pig bone parcel (net containing 2.8 kg of leg pig bones, H988-1) was deployed on the sediment, next to the pig bone parcels already deployed in December 2008. One pig bone parcel deployed in December 2008 was recovered (H930-4). Preliminary analysis revealed no Osedax colonization.

・ Sediment sampling

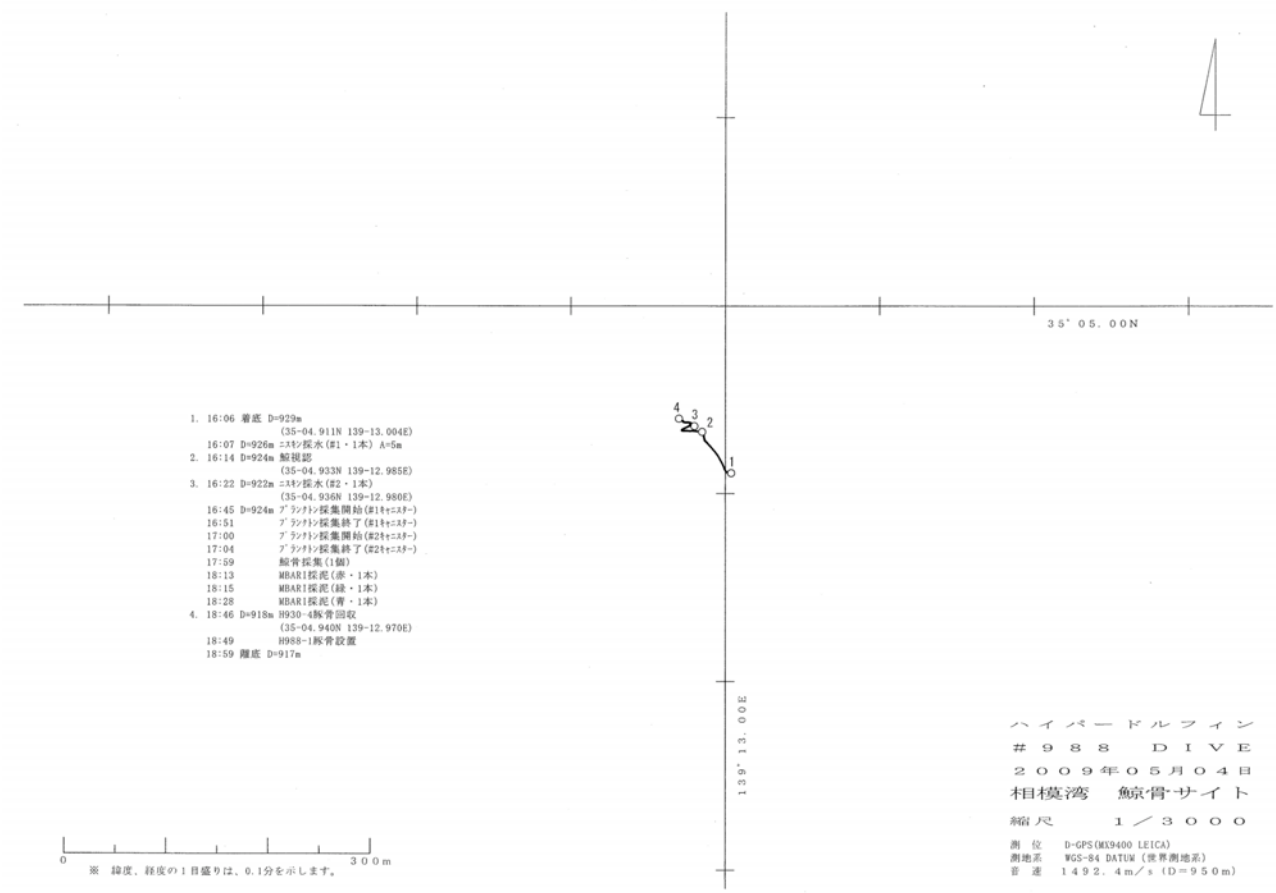
Sediment coring was conducted using three MBARI type corers. One core (red) was collected on the area where the collected rib was. The second core (green) was collected just next to the red one, in black sediments. The third core (blue) was collected at about 1 m away from the carcass.
MBARI cores will be used for microbiology and geochemistry analysis, as well as for diversity analysis.

・ Water sampling

Water samples were collected using two Niskin bottles at the beginning of the dive. One was collected 6 m above the bottom and away from the whale carcass. The second was collected at the whale fall site, at 3 m above bottom. These samples will be used or geochemistry analysis.

Sampling & marker points

(1) Niskin #1 35°04.911’ N, 139°13.004’ E, Depth: 929 m, Alt: 5 m
(2) Niskin #2 35°04.936’ N, 139°12.980’ E, Depth: 922 m
(3) MBARI core Red, Green, Blue, plankton sampling, whale rib sampling 35°04.936’ N, 139° 12.980’ E, Depth: 922 m
(4) Pig bone recovery & deployment 35°04.940’ N, 139° 12.970’ E, Depth: 918 m

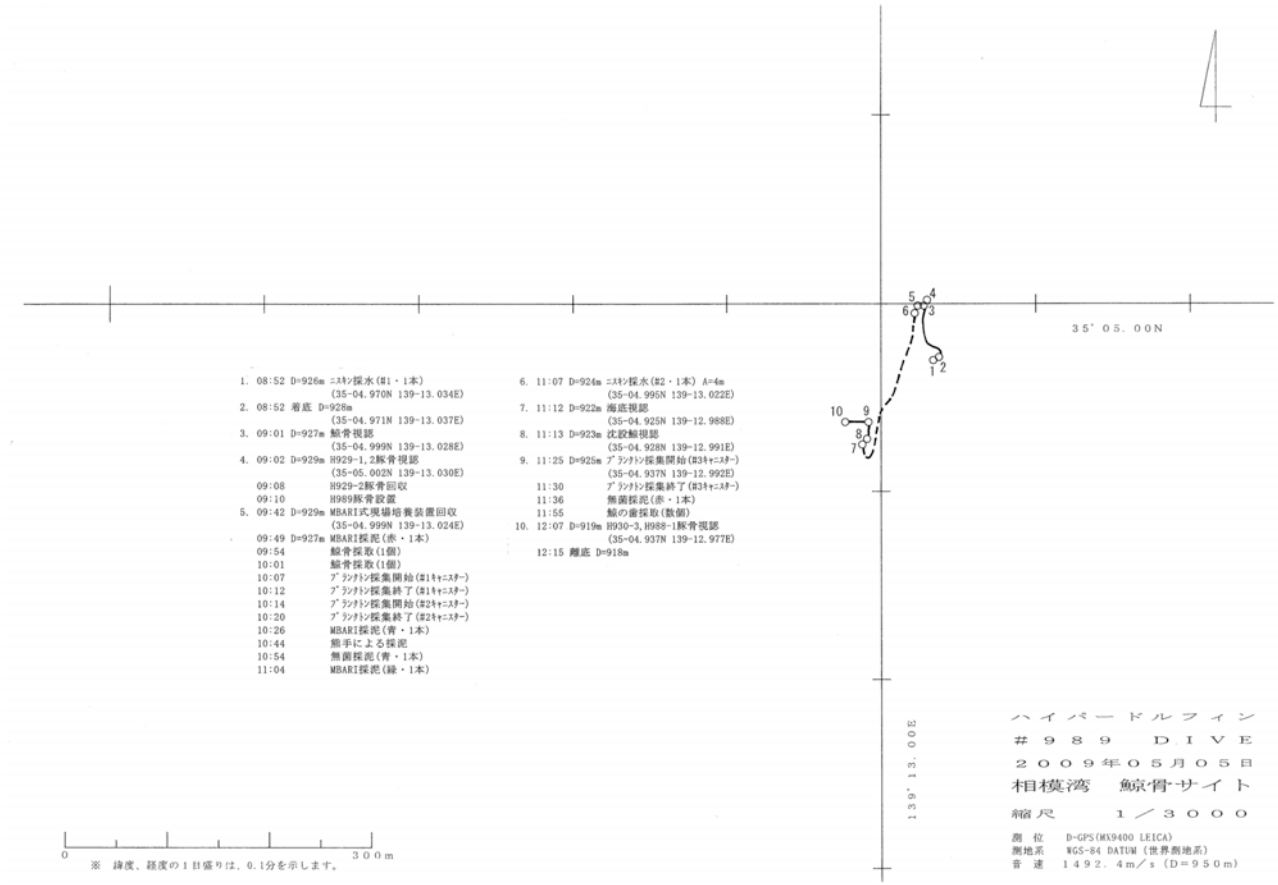


Video log

Time	Depth	Alt.	HDTV Camera
15:26	0		着水
15:35	0		潜航開始
16:06	929	2.6	着底
16:07	930	1.9	ニスキン採水（赤）No.1 Satomi より 50m ぐらい離れた場所
16:10	930		ヘッド 320 Satomi に向け移動開始
16:11	927	2.4	ソコダラ多数視認
16:13	924	3.4	アカドンコ視認
16:14	924	2.7	Satomi 鯨視認
16:15	925	1.7	白色域視認
16:15	923	1.9	Satomi 頭部観察
16:16	921	1.4	Satomi 全体像観察
16:21	923	2	ニスキン採水（緑）No.2 Satomi 頭部付近
16:23	923	2.7	着底せず SeaMaxSatomi 頭部撮影
16:26	923		
16:27	923		Satomi 頭部脇着底
16:28	923		Satomi 観察
16:32	923	0.5	オセダックス視認　頭骨の辺り
16:35	923		オセダックス探すため，肋骨をズームで観察

16:39	923	0.5	再びオセダックスを観察　頭骨の茶色に見える部分
16:45	923		スラープガンキャニスタ１番開始　　メータ３７２３９８　プランクトン採集
16:50	923	0.5	スラープガン終了
16:54	923		スラープガンキャニスタ２番開始　メータ 376881　プランクトン採集
17:00	923	0	２番キャニスタープランクトン採集
17:04	923		採水中止（四分間）３８０７８３
17:05	923		さとみ頭部にカニ
17:07	923		さとみ頭部ズームアップ観察
17:09	923		さとみ頭部付け根ズームアップ観察
17:12	923		頭部付近の肋骨観察
17:16	923		頭部より左へ数メートル移動
17:17	923		正面肋骨部拡大観察
17:24	923		全体像写真撮影のため１．２㍍移動
17:26	921	1.1	尾部方向へ徐々に移動，背骨にカニ多数
17:28	922	0.5	アナゴ
17:30	922	0	尾部方向から頭部へ向けて撮影
17:32	922		頭部から尾部へ向けて撮影
17:35	923	0.7	頭部正面へ移動
17:39	924	0	頭部先端部拡大（ＣＣＤ），歯一本
17:41	924		頭部に魚，あなご？
17:44	923	1.5	頭部から中心部へ移動
17:49	923	0.5	アームでボックスの蓋を開ける
17:50	923	0.6	肋骨をズームアップ
17:51			アームで肋骨を掴みボックスへ
17:56			折ろうとするが折れず
17:59	923	0.5	肋骨１本をボックス大へ採集完了　一部入らず蓋空いたまま
18:14	923	0.5	MBARI コア赤採泥　採集した肋骨の直下の黒い土辺り
18:16	923		MBARI コア緑採泥　赤の少しずらした場所
18:28	923	0.5	MBARI コア青採泥　鯨骨から１Ｍくらいはなれたところ
18:30			豚骨回収および設置のため，尾部のコンクリートの方へ移動
18:32	918	0.5	豚骨Ｈ９３０－３，４の前に着底
18:41	917	0.5	破れたネットの穴から大きなウロコムシ？泳いで逃げる
18:45	917	0.5	豚骨Ｈ９３４－４回収　一番手前のボックス小へ
18:49	917	0.5	設置用豚骨Ｈ９８８－１（黄ネット）コンクリートの前に設置
18:59	917		ビークル離底

4.2.18. Dive #989, 5 May 2009, NE Off Hatsushima Island, whale fall site (Fujiwara)



Video log

NT09-06			Area: Sagami Bay off Hatsushima	5.May.09
HPD Dive #		989		
Time	Depth	Alt.	HDTV Camera	Remarks(+CCD)
8:10	0		着水	
8:16	0		潜航開始	
8:27	150		魚視認	
8:36	426		イベント２番へ向かって航走開始	
8:41	586			イカ？視認
8:51	926	5	着底直前にニスキン採水（赤）	
8:52	928	3.5	着底	
8:54			ウナギ，魚視認	
			クラゲ視認	
8:55			ウナギ，ソコダラ視認	
9:00	925		鯨骨および豚骨視認	
9:02	929		豚骨横に着底，観察	
9:08			小黒 BOX（手前）へ豚骨（H929-2）回収	
9:10			回収しなかった豚骨（H929-1）横へ新たな豚骨（H989）設置	
9:14			鯨骨横へ着底し観察	

9:41			現場培養器回収	
9:48			MBARI 採泥（赤）	
10:01			大赤 BOX へ鯨骨回収	
10:03	927		BOX しめる	
10:04	927		キャニスタ 1 番へ	
10:05			メータ確認 382188	
10:07	927		スラープガンによるプランクトン採集開始　鯨骨前，海底から 20cm くらい　キャニスター番	
10:12	927		プランクトン採集終了メータ 388773	
10:13	927		キャニスタ 2 番へ回す	
10:14	927		スラープガン開始　脊椎骨の側面から少し離す　キャニスタ 2 番	
10:20	927		スラープガン終了　メータ 393707	
10:21	927		キャニスタ 3 番へ回す	
10:26	927		MBARI 青　脊椎骨をどかした直下	
10:32	927		熊手サンプラーによる堆積物採集開始　脊椎骨の直下	
10:47	927		熊手終了	
10:54	927		無菌採泥（青）　同様に脊椎骨直下の黒い土	
11:04	928		MBARI 緑　鯨骨（頭部）から約 1m 離れた地点	
11:06	925		さとみへ向かうため，離底	
11:07	923	3.8	ニスキン採水緑　離底後少し流してから	
11:09			クラゲ　赤くて大きい　視認	
11:13	922	3.5	さとみ鯨骨視認　頭部側から	
11:06	924	0.5	頭骨前に着底　しばらく撮影	
11:21	924	0.9	頭骨前にさらに近づく	
11:25	924	0.5	スラープガン開始 3 番　プランクトン採集　頭骨前の白い堆積物の 10~20cm くらい上	
11:30	924	0.5	終了　メータ 399663　　キャニスタ 4 番へ回す	
11:36	924	0.5	無菌採泥（赤）　げいろうと堆積物の際	
11:38	924	0.9	頭骨前に更に近づく	
11:39	924	0.5	キャニスタ 6 番　（めくら）へ回す	
11:49	924		右手のスラープガンのふたはずす　単キャニスタ使用に	
11:42	924	0.5	スラープガン開始	
11:43			つまったため一回止める　再開	
11:48	924	0.5	鯨歯採集　　何本か採集	
11:54		0.6	スラープガンにて骨らしき物採集	
12:00	923		鯨全体像撮影（SeaMax）	
12:06	918	0.5	豚骨観察	
12:12			豚骨観察終了	
12:16			離底	

4.2.19. Dive #990, 5 May 2009, Off Hatsushima Island, 1100 m deep site (Oguri)

観察：小栗一将

ダイブの目的：

（3） 小型シンタクティックボックスを設置、内部に染色液を導入し、シロウリガイを染色する。これによって、貝の成長速度を測定する。

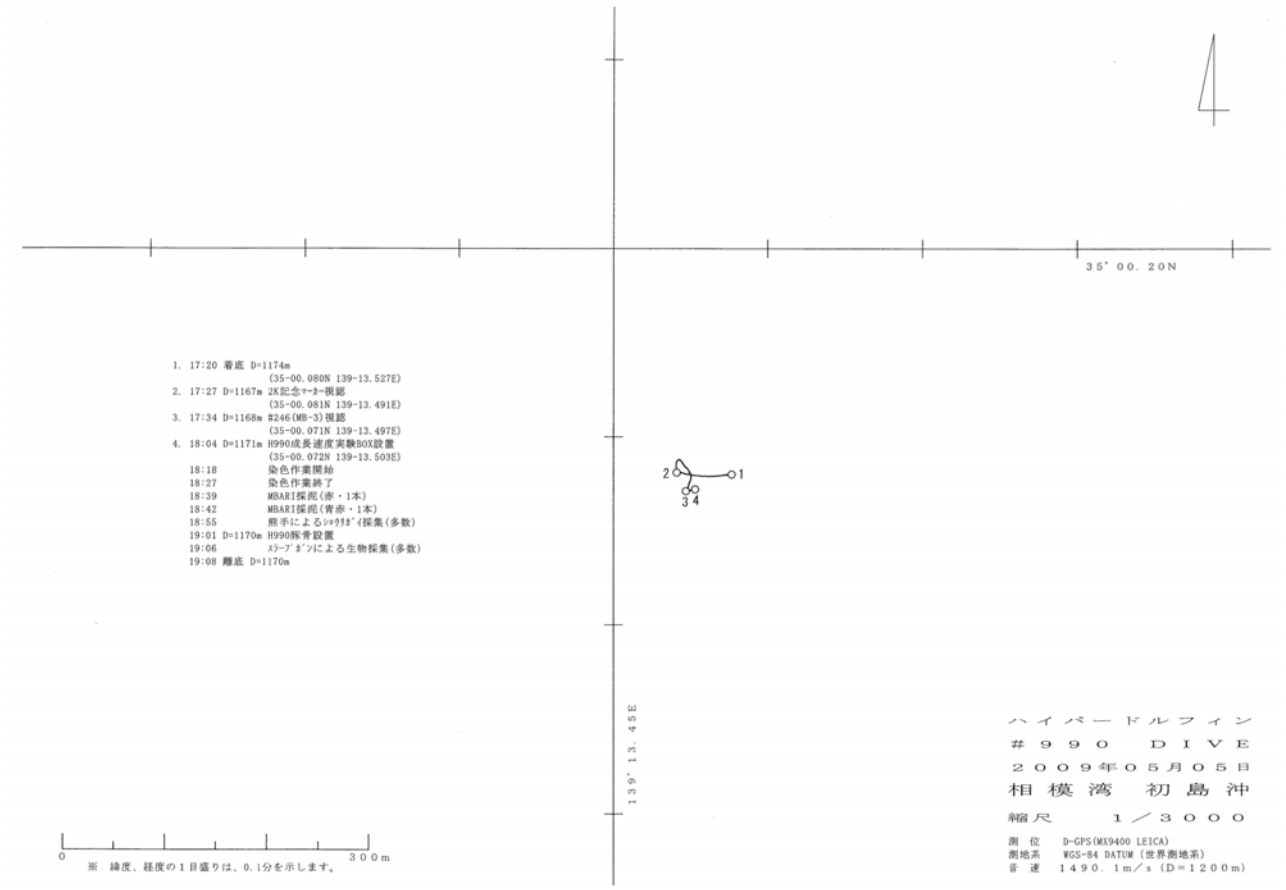
（4） シロウリガイが生息する場所の横でコアを採取し、硫化水素濃度を測定する。

（5） 熊手、スラープガンで生物を採取する。

（6） 豚骨を設置する。

ペイロード：

小型シンタクティックボックス 1、スラープガン 1 台、カルセイン溶液 20 リットル、MBARI 型コア 2 本、豚骨 1 袋



観察結果：

時間	水深	イベント
16:26	0	着水
16:37	0	潜航開始
17:20	1174	着底
12:33	1168	マーキングボックス発見
17:42	1170	染色ボックス設置
17:50	1170	染色液排出せず
18:02	1171	染色ボックスの排出口をスラープガンで吸い込み，染色液が出るか試みる
18:07		ボックスの，ポンプとスラープガンの位置を替える
18:09		再びスラープガンで吸い出し
18:13		スラープガン止
18:18		筒の外をスラープガンで吸う

18:21		蓋を掴む
18:24		スラープガン止
18:25		染色ボックススラープガン側に蓋をする
18:27		染色ボックス染色液側の蓋をする
18:28		染色ボックスを上から押す
18:32	1170	離底
18:33	1170	着底
18:34	1170.9	Box 蓋あける
18:35		豚骨を Box から取り出し，Box 前に置く
18:38		MBARI 赤　採泥　　シロウリガイのすぐ近く　　さらさら？コア取ると下が崩れる
18:40		MBARI 青赤　採泥　シロウリガイのすぐ近く　MBARI 赤採泥地点からすこし離れたところ
18:43		熊手とりだす　Box のふた閉じてしまう
18:44		Box のふたあける
18:47		熊手によるシロウリガイ採集開始
18:55		熊手によるシロウリガイ採集終了
18:58		離底　豚骨置くために移動
19:01	1169.8	豚骨設置　　大きい岩の横
19:04		カイメンをスラープガンで吸い込み開始
19:05		スラープガン吸い込み終了
19:08	1170	離底

5. Proposal for the future studies (ALL ONBOARD SCIENTISTS)

Deep-sea ecology & diversity (Watanabe, Furushima, Seo, Takahashi, Yoshida, Tame, Hongo, Hori, Nakamura, Maruyama, Imai, Iwamoto, Oguri, Toyofuku, Fontanier, Iwamoto, Aoki, Takishita, Kawachi, taxonomists, Fujikura)

（１）シロウリガイ類のすみわけメカニズムの解明
（２）シロウリガイ類の初期生活史と分散ポテンシャルの解明
（３）シロウリガイ類成熟サイズの解明
（４）シロウリガイ類の分布特性
（５）シロウリガイ類の交雑防止メカニズムの解明
（６）シロウリガイ類の成長速度の推定
（７）ツブナリシャジクの初期生活史の解明
（８）サガミマンジガイの初期生活史と成熟サイズの解明
（９）シンカイヒバリガイ類の成熟サイズの解明
（１０）化学合成生態系―光合成生態系の連鎖構造の解明
（１１）シロウリガイとシマイシロウリガイの短時間種判別方法の確立
（１２）シロウリガイ類寄生性コペポーダの形態および飼育
（１３）ハナシガイ類成熟サイズの解明
（１４）マクロ，メガベントスの多様性解析
（１５）原生生物，微細藻類の多様性解析

Physiology (Yuki Hongo, Akihiro Tame, Yoshimitsu Nakamura, Sayaka Hori, Takashi Toyofuku, Fumiyoshi Abe, Yuriko Nagano, Yuji Hatada, Tadashi Maruyama, Takao Yoshida（JAMSTEC）, Mitsuru Jimbo (Kitasato Univ.))

・ シロウリガイ類の卵や卵巣での共生細菌の局在と定量
・ シロウリガイ類の全組織における共生細菌の局在解析
・ シロウリガイ類をふくむ深海無脊椎動物の炭酸脱水酵素活性測定
・ シロウリガイ類共生細菌の細胞骨格タンパク質 MreB の局在解析
・ シロウリガイ類の共生機構解明のためのモノクローナル抗体解析用アッセイ系の開発
・ シロウリガイ類の膜タンパク質の解析
・ 真菌の多様性解析
・ アレイシア幼生の着床におけるレクチンの関与
・ シロウリガイ類やシンカイヒバリガイ類のエラ組織培養と遺伝子導入
・ 共生細菌の感染経路（セジメント・水）
・ シロウリガイ類やシンカイヒバリガイ類の血液細胞の解析

Population (Hideyuki Imai, Ryukyu Univ.)

The research to detect hybrids of Calyptogena soyoae and C. okutanii, requires DNA or allozyme analysis in the first place to find species-specific marker. Then, the results of maternal species identification by multiplex PCR using mitochondrial DNA are added to verify the existence of hybrid. We also plan to try discrimination analysis of shells.

We apply different analysis method from conventional analysis to reveal gene flow and degree of genetic diversity of Bathymodiolus platifrons. Considering the difficulties of allozyme analysis of mollusk, several possible buffers will be tried to find an appropriate condition in the first place. DNA analysis is conducted to reveal gene flow and degree of genetic diversity by finding a region in which genetic variability is accumulated.

Microbiology (Sayaka Hori)

（1）　堆積物、水試料からのシロウリガイ、シンカイヒバリガイの共生菌の同定（吉田）
（2）　変色域（バイオマット）に棲息するバクテリア群集と発現遺伝子の解析
（3）　ハゲナマコの腸内細菌の解析

Further investigations concerning living benthic foraminifera (Toyofuku, Fontanier, Oguri, Nomaki, Tsuchiya and Kitazato)

(1) Foraminiferal ecology

For sure, it seems relevant and fascinating to sample once again cold-seep areas following a reliable multidisciplinary approach. A straight transect of 5 sites from non-seep sediment to the middle of a Calyptogena colony (off Hatsushima) would be a perfect occasion to appreciate ecological tolerance of foraminiferal communities along heterogeneous environments. This transect may be 25-m long. At each site, abiotic parameters should be measured (oxygen, pH, alkalinity profiles in the sediment). Sedimentary features (inorganic material and organic detritus) should be investigated (RX, colorimetry, Chla, Phaeopigment, C/N…). Bacterial distribution should be also studied along the cores. With all those data, we should be able to understand the ecological limitation controlling foraminiferal distribution. Finally, we shall investigate foraminiferal growth rate with calcein stained specimens what will be recovered during another Fujikura-san' s cruise on next January, 2010. Fujikura-san made in-situ calcein-$SrCl_2$ double staining experiment to clarify the growth rate of Calyptogena. Calcareous foraminifera in surrounding sediment will be also stained by these dyes. They are very useful to decide deep-sea foraminiferal growth rate.

(2) Foraminiferal metabolism

It seems crucial to precise metabolic pathway of a very intriguing foraminiferal taxon. Living (stained) Chilostomella spp. (Chilostomella oolina and Chilostomella ovoidea) have already been documented in organic matter enriched sediment from outer shelf, open slope and canyon environments (e.g. Kitazato et al., 2000; Fontanier et al., 2002; Langezaal et al., 2006). It is commonly described in cold-seep areas from Sagami Bay. Living (stained) adults and juveniles are commonly observed around zero oxygen boundary as deep infaunal dwellers in the sediment. This species has obviously very low growth rate, adding new chamber after more than 90 days (culture conditions). In situ feeding experiments and culture experiments revealed that Chilostomella ovoidea is not able to ingest fresh algae and bacteria (Kitazato et al., 2003, Nomaki et al., 2005a; 2005b; Nomaki et al., 2006). Chilostomella ovoidea may take preferentially dried Chlorella (Kitazato and Ohga, 1995). Therefore, this taxon may be considered as a deposit feeder, ingesting more or less degraded organic matter at random in the deeper part of the sediment (Nomaki et al., 2006; 2008). It may also host endosymbionts or ectosymbionts chemiolithotrophic bacteria that would provide organic compounds. As far as Chilostomella spp. is recorded in oxygen depleted and anoxic sediment, it may be a facultative anaerobe using nitrate or sulphate as electron acceptor instead of oxygen (heterotrophic modes n°1 and 2; Fig. 1). Conversely, Chilostomella spp. may present chemiolithotrophic metabolism, using ammonia or hydrogen sulphide to fix dissolved inorganic carbon (autotrophic modes n°3 and 4; Fig. 1). Some many questions without responses. With solid protocols (enzyme probes, TEM observations,…) and by using living individuals collected around cold-seep areas, we could precise metabolism of Chilostomella spp.　It would be for sure a great step for Science!

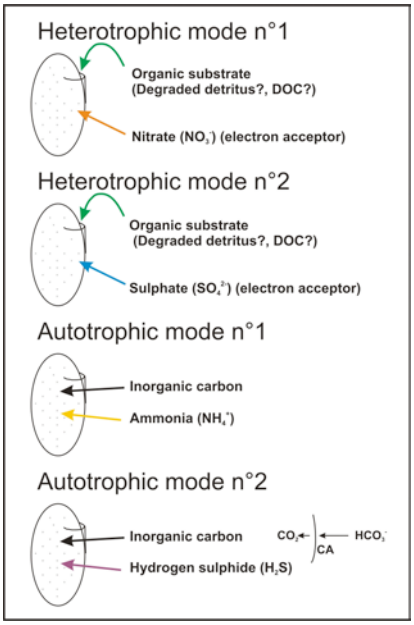


Fig. 1 Some putative metabolic pathways for Chilostomella spp.

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LIVE (STAINED) AND DEAD FORAMINIFERAL FAUNAS ASSOCIATED WITH COLD SEEPS (SAGAMI BAY, JAPAN): SOME PRELEMINARY OBSERVATIONS

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Abstract

In this preliminary report, we propose to investigate live (Rose-Bengal stained) and dead benthic foraminifera collected in a cold-seep area off Hatsushima Island (Sagami Bay, central Japan) (Cruise NT06-04, March 2006). We focus on the topmost sediment of two cores sampled at different sites located at the similar depths (~1200 m). The first core was collected in a Calyptogena field (named the South Colony Area). The second one was collected in non-seep site, ~100 m away from the South Colony Area. The core collected at the South Colony Area is characterized by coarse sediment (predominantly sand-size class) with some glauconitic inner moulds of planktonic foraminifera. Such sedimentary features may be related (1) to the deposition of reworked material coming from shallower depth, (2) active winnowing by strong bottom currents or (3) casual winnowing by seepage. No living foraminifera and only few dead foraminifera were found in the uppermost sediment from this Calyptogena site. Such a foraminiferal desert may echo a recent benthic storm related to complex hydrosedimentary processes prevailing at this site. The foraminiferal assemblage from the non-seep area is characterized by agglutinated taxa. Living fauna is poorly diverse and presents low standing stock. This suggests unfavorable conditions prevailing at this site. The presence of acidic pore water (pH of 7.45-7.60) in the topmost sediment may explain the absence of calcareous species. Finally, a strong spatial variability of foraminiferal fauna and geochemical conditions is recorded between both sites. However, the absence of replicates for both zones and the only investigation of the uppermost sediment for benthic foraminifera make it very hard to establish firm conclusions from our foraminiferal and geochemical data. Further investigations are required to enlighten the fascinating environmental variability recorded in the cold-seep areas off Hatsushima.

Keywords: Cold seep, Benthic foraminifera, Spatial variability

1. Introduction

In continental margin, cold seeps constitute very complex biotopes. They are commonly characterized by methane- and hydrogen-sulfide-rich fluids trickling out the sediment through the sediment-water interface. Along the sediment layers, a succession of biogeochemical

reactions explains surface seepage (e.g. Campbell, 2006). In methanogenic zone, methane production is commonly related to CO_2 reduction and acetate fermentation around detrital organic matter trapped in the deeper sediment (Reactions 1 and 2 in Table 1) (e.g. Claypool and Kaplan, 1974; Borowski et al., 1999). At the Sulfate-Methane Interface (SMI), methane is generally oxidized by microbial consortia. It produces hydrogen sulfide. Sulfate-reducing bacteria are involved in this methane anaerobic oxidation (Reaction 3 in Table 1) (e.g. Reeburgh, 1982; Borowski et al., 1999; Treude et al., 2003; Takeuchi et al., 2007). In the upper sediment, hydrogen sulfide is also provided by the anaerobic oxidation of organic detritus by seawater sulfate (sulfate-reducer bacteria involved in this reaction; Reaction 4 in Table 1) (e.g. Bemer, 1980; Sibuet and Olu, 1998).

$CO_2 + 4H_2 \Diamond\ CH_4 + 2H_2O$ (CO_2 reduction) (1)
$CH_3COOH \Diamond\ CH_4 + CO_2$ (acetate fermentation) (2)
$CH_4 + SO_4^{2-} \Diamond\ HCO_3^- + HS^- + H_2O$ (methane anaerobic oxidation) (3)
$2(CH_2O) + SO_4^{2-} \Diamond\ 2HCO_3^- + H_2S$ (sulfate anaerobic reduction) (4)

Table 1. Main geochemical reactions inducing methane and hydrogen sulfide production in cold-seepsediment.

Finally, all these reactions induce an overall increase of alkalinity at the SMI and in the upper sediment. This may induce enhanced precipitation of authigenic carbonate (calcite, dolomite and aragonite) (e.g. Takeuchi et al., 2007). At the sediment-water interface, hydrogen sulfide and methane which have not been completely consumed in the deeper sediment, feed chemosynthetic communities among which metazoan benthos such as vesicomyid clams, mytilid mussels or siboglinid tubeworms thrive with mutual endosymbiotic prokaryotes (mainly sulfide-oxidizing bacteria) (e.g. Childress et al., 1987; Sibuet and Olu, 1998; Sahling et al., 2002; Levin and Mendoza, 2007). Differences in sulfide and methane concentrations and fluxes in the topmost sediment induce the zonation of chemoautotrophic communities (Sahling et al., 2002).

Cold seeps from Japanese active margin have been investigated for more than two decades (e.g. Ohta et al., 1987; Akimoto et al., 1994; Hashimoto et al., 1995; Kitazato, 1996; Momma et al., 1998; Ogawa et al., 1999; Yamaoka et al., 1999). Southeast off Hatsushima Island (Sagami Bay), several colonies of the vesicomyid clam Calyptogena spp. and bacterial consortia are nourished by cold seepage. There, seeps are closely related to the submarine active fault called the Izu-Toho Line or Western Sagami Bay Fracture. They have been intensively studied with JAMSTEC high-technology equipment (submersible “ Shinkai 2000” and “ Shinkai 6500”, ROVs, in situ measurements, in situ experiments) in order to understand the complex biogeochemical relationship prevailing in these unfavorable environments. In this preliminary report, we propose to investigate live (Rose-Bengal stained) and dead benthic foraminifera collected in the cold-seep area off Hatsushima Island (Sagami Bay) (Fig. 1). We focus on the topmost sediment of two cores sampled at different sites located at the same depth (~1200 m). The first core was collected in a Calyptogena field (named the South Colony Area). The second one was sampled in putative non-seep sediments, ~100 m away from the South Colony Area. In both areas, oxygen and pH at and below sediment-water interface were measured on board, enlightening the geochemical background in both study areas. We propose to compare dead and living (Rose-Bengal stained) foraminifera from both sites in order to precise the spatial variability of faunas between both types of environment. We will compare our data with observations already done in cold-seep environments.

2. Background: Foraminiferal communities from deep-sea cold seep.

Live (Rose-Bengal stained) and dead benthic foraminifera from recent deep-sea cold seeps have been investigated in different areas from the world ocean (Table 2). Below, we propose a

synthesis of the major ecological and biogeochemical observations concerning recent foraminiferal assemblages.

(1) Akimoto et al. (1994) investigated foraminiferal assemblages (Rose-Bengal stained and dead foraminifera) from different cold seeps in Sagami Bay. They studied the uppermost 2 cm of sediment. Bulimina striata, Rutherfordoides cornuta and Bulimina aculeata are predominant species at all stations without any preference for seep or non-seep environments. However, Bulimina striata and Rutherfordoides cornuta are more abundant in Calyptogena colonies, and related cold methane- and sulfide-rich seepage off Hatsushima. Bulimina aculeata and Chilostomella ovoidea thrive preferentially in fine sediments away from vesicomyid colonies.

(2) Sen Gupta and Aharon (1994) investigated foraminiferal assemblages (Rose-Bengal stained and dead foraminifera) from the Gulf of Mexico in different cold-seep conditions (Beggiatoa bacterial mats, hydrate mounds with and without mussels Bathymodiolus). Only the 0-1 cm sediment interval was investigated. This work revealed low density and low diversity. However, the seep faunas are characterized by taxa recorded in non-seep environments from the Gulf of Mexico (Bolivina ordinaria, Gavelinopsis translucens, Bolivina subaenariensis, Uvigerina laevis). The foraminiferal $d^{13}C$ was measured on dead Uvigerina peregrine. It shows anomalous ^{13}C depletions and widespread $d^{13}C$ values (-1.3‰ to +0.4‰) in seep compared to non-seep environments (~ -0.25‰). According to the authors, this reflects " hydrocarbon oxidation effect" on the foraminiferal $d^{13}C$ of infaunal dwellers from cold seep. Finally, authors proposed that Beggiatoa may be either potential chemolithoautotrophic endosymbionts detoxifying the environments and providing CO_2, or a food source for foraminifera.

(3) Kitazato (1996) summarized studies done by Kaminski (1988), Jones (1993) and Akimoto et al. (1994). He mentioned that both benthic foraminiferal species associated with cold seepage from Sagami Bay (Rutherfordoides cornuta and Bulimina striata) are not endemic and can be found in oxic bottom or in anoxic micro-environments below the surface oxic layer. He proposed that to survive in anoxic/euxinic cold seep, foraminifera may use anaerobic respiration system or may be in symbiosis with sulfide oxidizing bacteria.

(4) Sen Gupta et al. (1997) published data about foraminiferal assemblages from the Gulf of Mexico. They looked at the 0-5 cm sediment interval at cold seep characterized by Beggiatoa bacterial mats. Most foraminiferal species (e.g. Gavelinopsis translucens and Bolivina ordinaria) are not exotic taxa but may recruit from the non-seep surrounding area. Some species found in the H_2S-rich anoxic sediment some millimeters under the microbial mats (especially Bolivina albatrossi) may be either microaerophiles or facultative anaerobes.

(5) Rathburn et al. (2000) worked on the Rose-Bengal stained foraminifera sampled from the northern California margin. They also investigated the carbon and oxygen isotopes of their test. This study showed that cosmopolitan species (Globobumimina pacifica, Chilostomella ovoidea, Bolivina subargentea, Buliminella tenuata, Loxostomum pseudobeyrichi Uvigerina peregrina, Nonionella globosa), commonly described as tolerant for organic-rich and oxygen-depleted environments, may thrive in cold seeps. Authors proposed that those taxa are " pre-adapted for life at seeps or taxa originating at seeps may have been pre-adapted for life elsewhere" . Foraminiferal $d^{13}C$ presents wide range that is probably related to light $d^{13}C$ bicarbonate-rich fluids that may result from methane oxidation in the upper sediment.

(6) Bernhard et al. (2001) investigated foraminiferal communities from Monterey Bay (central California margin) comparing foraminiferal faunas in the 0-1 cm sediment interval from cold seep and non-seep environments. Those seeps are characterized by bacterial mats (Beggiatoa) and clam fields. Rose-Bengal stained Cassidulina delicata, Epistominella pacifica, Spiroplectammina biformis are relatively more abundant at seeps compared to non-seep

environs. Some other taxa were common in both types of environments (Bolivina pacifica, Bolivina spissa, Bulimina mexicana, Epistominella exigua and Praeglobobulimina spinescens). However, foraminiferal densities are low. Using ATP method and ultrastructural observations, Bernhard et al. confirmed the presence of actually living foraminifera in seep environments (Bolivina spissa, Buliminella tenuata, Epistominella pacifica, Globobulimina sp., Loxostomum pseudobeyrochi, Praeglobobulimina spinescens, Uvigerina peregrina). Moreover, some prokaryotes, considered as potentially ectosymbionts, were observed at the pore plugs of U. peregrina.

(7) Torres et al. (2003) investigated living (Rose-Bengal stained) and fossil foraminifera from Hydrate Ridge (Cascadia convergent margin, off Oregon). They compared $d^{13}C$ of foraminiferal species with $d^{13}C$ of dissolved inorganic carbon in the pore water ($d^{13}C_{DIC}$). They studied cores collected in bacterial mats, clam fields, non-seep sites close to seepage area and other background sites. The foraminiferal standing stock is higher in seeps compared to other environments, suggesting that foraminifera are attracted by rich bacterial food sources at methane seep. As depicted by the strong disequilibrium between $d^{13}C_{DIC}$ of methane-rich pore water and $d^{13}C$ of foraminiferal calcite in seeps, living foraminifera (e.g. Uvigerina peregrina) would calcify mostly during periods when there is little methane discharge or during intermittent episodes of seawater flow into the sediments. They proposed that $d^{13}C$ of fossil foraminifera may be altered by the formation of secondary authigenic carbonate. Finally, foraminiferal fauna do not quantitatively record the isotopic signal associated with methane seepage.

(8) Rathburn et al. (2003) investigated living (Rose-Bengal stained) foraminifera, their stable isotopic signals and the biogeochemistry of seep pore waters in Monterey Bay. They compared bacterial mats, clam fields and non-seep environments, looking at foraminifera along 10-cm long cores. No endemic calcareous foraminiferal species are observed at Monterey seeps. Predominant species are Uvigerina peregrina, Bulimina mexicana, Epistominella pacifica, Globobulimina pacifica. At clam fields and bacterial mat, vertical foraminiferal distribution is surprising with density maxima found in the deeper layers of the sediment without clear microhabitat segregation between species. Foraminiferal $d^{13}C$ is always lower for all taxa thriving in methane-rich environments compared to less active seeps. Finally, authors assume that the variability of $d^{13}C$ signatures within foraminiferal species associated with seeps may reflect the variability of seep pore water geochemistry and possibly the influence of aggregations of organic material and bacteria.

(9) Hill et al. (2004) investigated living (Rose-Bengal stained) and fossil foraminifera from Hydrate Ridge (Cascadia convergent margin) off Oregon. They worked on material collected in microbial mats and in clam field, focusing on foraminiferal $d^{13}C$. Average and single specimen $d^{13}C$ values of the three dominant species (Uvigerina peregrina, Cibicidoides mckannai, Globobulimina auriculata) indicate the influence of environmental methane, with clear shift to lower values compared to samples from a non-seep control site. According to the authors, depleted food source (bacterial biomass) and/or symbionts may also contribute to the depletion of isotopic signatures.

(10) Heinz et al. (2005) also investigated living (Rose-Bengal stained) foraminifera from Hydrate Ridge (Cascadia convergent margin) and neighboring basins, off Oregon. They studied 5-cm long sediment cores, and compared communities sampled in clam fields, bacterial mats, non-seep surrounding sediments and in two other adjacent basins. Uvigerina peregrina, Epistominella exigua are predominant foraminiferal species from seep environments. Those species may indicate eutrophic conditions and high amounts of organic material at these sites. However, in one core collected in a non-seep area, authors did not

find any calcareous foraminiferal species suggesting the effect of“ small-scale differences in environmental conditions such as interfacial fluxes of oxygen, methane, sulfate and sulfide or turnover rate of anaerobic methane oxidation (Treude et al. 2003). Seepage can be very diffuse and some influence of methane in non-seep sediments, and therefore an influence on living benthic foraminifera, cannot be excluded.”

(11) Mackensen et al. (2006) studied cold seeps from Northern Norwegian continental margin at Håkon Mosby Mud Volcano. The authors investigated the isotopic signals of Rose-Bengal stained foraminiferal species Fontbotia wuellerstorfi, Cassidulina neoteretis and Cassidulina reniforme. Those species were found in pogonophore fields (Sclerolinum contortum) and in bacterial mats. F. wuellerstorfi was recorded as an epibenthic taxon attached on pogonophores, avoiding low oxygen content of the sediment. Low $d^{13}C$ values of this species may be related to (1) ^{13}C-depleted ingested methanotrophic biomass on which the foraminifera prey, or (2) low $d^{13}C_{DIC}$ transported within the pogonophoran tube from depth in the sediment up. Very low $d^{13}C$ values of endobenthic Cassidulina spp. suggest that both species record a pore water signal depleted by the oxidation of methane and by enhanced organic carbon decomposition.

(12) Sen Gupta et al. (2007) investigated benthic foramifera attached on vestimentiferan tubeworms protruding over cold-seep sediments from the Gulf of Mexico. They observed different foraminiferal species in life position on the tubes. Some of these taxa are commonly observed on elevated substrate in well-oxygenated conditions (e.g. Cibicides wuellerstorfi, Planulina ariminensis). With such microhabitat, those foraminiferal species would avoid the oxygen depletion and H_2S toxicity at the sediment-water interface.

Study	Area	Depth	Cold-seep Type	Methods	$\Delta^{13}C/\Delta^{18}O$	Predominant species
Kaminski (1988)	Gulf of Mexico, Louisiana Continental Slope	532-685 m	-	Total assemblages	No	*Textularia wiesneri, Trochammina glabra*
Jones (1993)	North Sea	152-172 m	Bacterial mats (*Beggiatoa*)	Total assemblages	No	*Uvigerina peregrina, Cassidulina laevigata, Hyalinea balthica, Elphidium clavatum*
Akimoto et al. (1994)	Sagami Bay, central Japan	1100 m	*Calyptogena* colonies, Methane + Sulfide	>125 µm: RB	No	*Bulimina striata, Rutherfordoides cornuta* (biofacies)
Sen Gupta and Aharon (1994)	Gulf of Mexico, Louisiana Continental Slope	216-695 m	Bacterial mats (*Beggiatoa*), Hydrate mounds, *Bathymodiolus* sp.	>63 µm: RB	Yes (unstained tests, >250 µm)	*Bolivina albatrossi, Bolivina ordinaria, Bolivina subaenariensis, Bulimina alazanensis, Cassidulina neocarinata, Gavelinopsis translucens, Trifarina bradyi, Uvigerina laevis, Uvigerina peregrina*
Sen Gupta et al. (1997)	Gulf of Mexico, Louisiana Continental Slope	543-587 m	Bacterial mats (*Beggiatoa*)	>63 µm: RB, Ultrastructures	Yes (unstained tests, >250 µm)	*Gavelinopsis translucens, Bolivina ordinaria, Trifarina bradyi, Bolivina albatrossi, Osangularia rugosa*
Rathburn et al. (2000)	Northern Californian margin	500-525 m	*Calyptogena pacifica* colonies, BWO = 30-40 µM	>150 µm: RB	Yes (stained and unstained)	*Globobumimina pacifica, Chilolostomella ovoidea, Bolivina subargentea, Buliminella tenuata, Loxostomum pseudobeyrichi, Uvigerina peregrina, Nonionella globosa*
Bernhard et al. (2001)	Monterey Bay, central California margin	906-1003 m	Bacterial mats (*Beggiatoa*) and clams	>63 µm: RB, Ultrastructures >75 µm: ATP	No	*Cassidulina delicata, Epistominella pacifica, Fursenkoina rotundata, Spiroplectammina biformis*
Rathburn et al. (2003)	Monterey Bay, central California margin	960-1009 m	Bacterial mats and *Calyptogena* clams, BWO = 15.6 - 17.8 µM	>150 µm: RB	Yes	*Uvigerina peregrina, Bulimina mexicana, Epistominella pacifica, Globobulimina pacifica, Gyroidina altiformis*
Torres et al. (2003)	Hydrate Ridge, Cascadia convergent margin off Oregon	590-780 m	Carbonate crusts, bacterial mats and clams	>125 µm: RB	Yes	*Uvigerina peregrina*
Hill et al. (2004)	Hydrate Ridge, Cascadia convergent margin off Oregon	Not presented	Bacterial mats and clams	>63 µm: RB and dead	Yes	*Uvigerina peregrina, Cibicidoides mckannai, Globobulimina auriculata*
Heinz et al. (2005)	Hydrate Ridge, Cascadia convergent margin off Oregon	785-787 m	Bacterial mats and clams	>63 µm: RB	No	*Uvigerina peregrina, Epistominella exigua*
Mackensen et al. (2006)	Northern Norwegian continental margin, Håkon Mosby Mud Volcano	1260-1281 m	Pogonophoran tubeworm *Sclerolinum contortum*, bacterial mats	>63 µm: RB	Yes	*Fontbotia wuellerstorfi, Cassidulina neoteretis, Cassidulina reniforme*
Sen Gupta et al. (2007)	Gulf of Mexico, Louisiana Continental Slope	562-2918 m	Vestimentiferan tubeworm *Escarpia laminata* and *Lamellibrachia luymesi*	No	No	*Cibicides wuellerstorfi, Planulina ariminensis, Anomalinoides globulosus, Patellina corrugata, Laminononion tumidum, Cornuspira involvens, Cornuspira foliacea, Spirillina vivipira, Calcituba polymorpha, Ammoscalaria tenuimargo, Deuterammina rotaliformis, Veleroninoides jeffreysii*

Table 2. Major works dealing with foraminiferal ecology and biogeochemistry in recent cold seeps. “ Methods” column indicates the investigated size fraction and the method used to identify living foraminifera. In some studies, total assemblages (living + dead) were investigated. “ RB” means Rose-Bengal staining.

3. Study area

3.1 Hydrological settings

The first hundreds meters of saline water that spread in Sagami Bay are mainly derived from Kuroshio Current (Salinity = ~34.70). Deeper, short-time intermediate intrusion of low salinity water (LSW) into the bay occurs at about 500-m isobath. The LSW is related to the low-salinity Intermediate Oyashio Water (IOW, salinity < 34.20, high dissolved oxygen concentration >3.5 ml/l^{-1}) (Yang et al. 1993; Senjyu et al., 1998; Zhang and Nozaki, 1998). This intruding water is separated from the offshore North Pacific Intermediate Water by the current zone of the Kuroshio (Yang et al. 1993; Senjyu et al., 1998; Zhang et Nozaki, 1998). Below 1000 m, the Pacific Deep Water (PDW) characterized by higher salinity (>34.40) fills the basin.

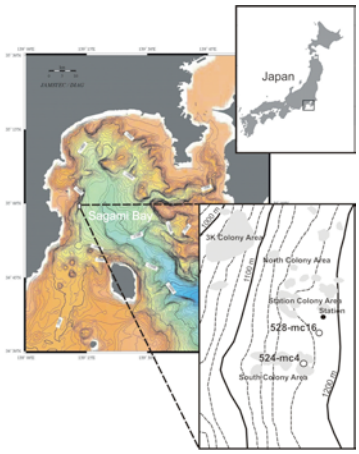

Fig. 1 Study area, bathymetry and geographical position of the cold-seep area off Hatsushima Island (Sagami Bay, Central Japan). In the bottom-right-corner map, grey areas represent different Calyptogena clam fields (modified from Ogawa et al., 1999). Both cores 524-mc4 and 528-mc16, studied in this report, are plotted with open circles. The filled circle represents the reference station. The bathymetric map of Sagami Bay was kindly provided by H. Nomaki.

3.2 Primary production and exported organic matter

A seasonal survey of surface water productivity was performed in the central Sagami Bay over the permanent benthic station SB (35°00’ N, 139°22.5’ E) (Kanda et al., 2003). This work focused on a sampling period between December 1996 and August 1998. It revealed a strong inter-annual variability of primary production, which may be related to the change of Kuroshio surface current intensity into the bay. When nutrients are available, a serial of independent bloom events take place from February to May. Integrated chlorophyll maxima of about 70 $mg\text{-}Chl.m^{-2}$ for the 50-meters-thick surface water are recorded in April-May (Kanda et al., 2003). The earlier bloom event (February) is mainly characterized by diatom species including Thalassiosira spp., Coscinodiscus spp., Chaetoceros spp., Rhizosolenia spp. and Skeletonema spp. (Kanda et al., 2003). In boreal spring (May), a bloom of dinoflagellates (Ceratium furca) is recorded (Kanda et al., 2003). Kitazato et al. (2000) assume the existence of a fall bloom

occurring in October-November. Finally, Sagami Bay may be considered as a site of very high primary production with values ranging from 360 to 2100 mg-C.m^{-2}.day (Kitazato et al., 2000).

3.3 Exported organic matter

The relationship between pelagic production and benthic response has been documented in several studies at about 1400 m depth (Kitazato and Ohga, 1995; Ohga and Kitazato, 1997; Shimanaga and Shirayama, 2000; Kitazato et al., 2000). The benthic faunas (bacteria, foraminifera and metazoan meiobenthos) respond more or less clearly to phytodetritus deposits during spring bloom periods. Foraminifera are more reactive than bacteria and metazoan meiofauna. In those studies, high Chloroplastic Pigment Equivalents (CPE) concentration in the sediment and centimetric greenish gray fluffy layer were recorded at the sediment-water interface between February and June. However, lateral advection may be an important processes inducing consistent input of organic matter to the deeper basin (Noriki et al., 1997; Shimanaga and Shirayama, 2000, Nakatsuka et al., 2003). For instance, Nakatsuka et al. (2003) observed important concentration of Chl-a in a benthic nepheloid layer during summer. It indicates a putative rebound of phytodetritus from the seafloor across slope after spring bloom events. This resuspension may be related to tidal currents, and would explain high organic matter accumulation at the sediment-water interface in the deeper part of the basin. Finally, high sedimentation and important burial of organic carbon sustain cold seepage activities in the edge of Sagami Bay.

4. Materials and methods

During the cruise NT06-04 aboard R/V Natsushima, several sediment cores were collected with the ROV Hyper-Dolphin off Hatsushima Island in the well-documented cold-seep area (Fig. 2; Table 3).

4.1 Foraminiferal sampling

For foraminiferal study, two cores were collected with MBARI Plexiglas tube (internal diameter = 7.0 cm, surface area = 38.5 cm²). The first core 524-mc4 (35°-00.092'N; 139°-13.513' E, 1174 m) was collected the 13th of March 2006 at 11h20' AM in the South Colony Area (Dive #524) (Figs. 1 and 3a; Table 3). The sediment core was 18 cm long. The sediment was brownish silty sand down to 12 cm depth. Silty sand was observed below. The sediment was generally made of interleaved coarse sand/shell sand, including living polychaetes and small sized bivalves. The second core 528-mc16 (35°-00.122' N; 139°-13.536' E, 1188 m) was collected the 15th of March 2006 at 11h06' (Dive #528) (Fig. 1 and 3b; Table 3). This core was collected ~100 meters away from the first core in a non-seep environment. The core was 17 cm long. The sediment was brownish for the topmost 0-3 cm interval and included blackish spots between 3 and 13 cm depth. Olive gray silt dominated in the 13-16 cm depth interval. Pumice was observed at 16-17 cm. Living polychaetes were present.

Core	Dive No.	Date	Time	Locality	Lat.	Long.	Depth (m)
524-mc4	524	03/12/2006	11:20	*Calyptogena* field, the South Colony Area	35°00.092'N	139°13.513'E	1174
528-mc16	528	03/15/2006	11:06	Non-seep area, ~100 m away from 524-mc4	35°00.122'N	139°13.536'E	1188

Table 3. Location of both cores 524-mc4 and 528-mc16 used for foraminiferal investigation

Aboard ship, the sediments were vertically subsampled at 0.5 cm intervals down to 5 cm, and 1 cm intervals from 5 to 10 cm depth. Each of these layers was preserved in a solution of 4%

buffered formalin (diluting 37% formaldehyde solution by a factor of 10 using filtered seawater). As far as the sediment surface of core 524-mc4 was strongly oblique (Fig. 3a), a rough surface layer of about 1-cm thick was firstly sampled (“ homogenization sample”). In the laboratory, samples were washed and sieved with a nested 32 μm mesh sieve. Sieved sediments were stained with a solution of Rose-Bengal stained water (1g/L) for 1 day. Then, sediments were wet-sieved again and dried in an oven (~50°C). All >32 μm fraction samples were split into manageable volumes for examination using a modified microsplitter. For this preliminary study, we investigated the 0-0.5 cm interval of both cores. We also inspected the homogenization sample from core 524-mc4. The stained and fossil benthic foraminifera from the >32 μm size fraction were picked from dry sample, sorted on Plummer slides, and identified at a species level (when possible).

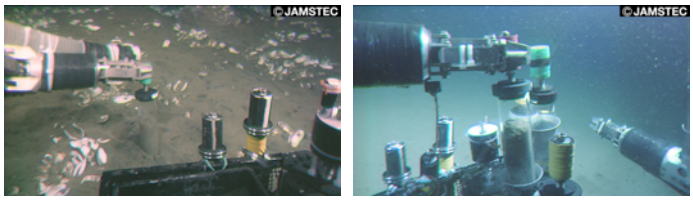

Fig. 3a Cores 524-mc4 (a) and 528-mc16 (b) collected off Hatsushima. Core 524-mc4 was sampled in a clam field (The South Colony Area). Core 528-mc16 was collected in a non-seep environment with putatively normal sediment.

4.2 Geochemical analyses

At both sites, pH and dissolved oxygen were measured from the sediment-water interface downcore into the sediment. Those measurements were performed onboard on two MBARI cores (524-mc5 and 528-mc15) collected with the ROV Hyper-Dolphin. Both cores are very close (less than 1 meter) to cores 524-mc4 and 528-mc16. Dissolved oxygen (DO) was measured with microelectrode (Unisense A/S, Aarhus, Denmark) calibrated with Winkler method. The DO measurements began just after the recovery of sediment cores on deck. In core 524-mc5 (the South Colony area), DO was measured every 500 μm from 5 mm above the sediment-water interface to 34.5 mm depth downcore. In core 524-mc15 (the non-seep area), DO was measured every 500 μm from 12 mm above the sediment-water interface to 20.5-mm depth downcore. pH was measured with IQ200 pH-meter (IQ Scientific Instruments Inc., San Diego, CA, USA) from the sediment-water interface downcore with a resolution of one measurement every 1 cm. Other environmental data (bottom water temperature and salinity, ~2 m above the sea-floor) were measured with CTD attached on the upper part the ROV Hyper-Dolphin (Table 4)

Dive No.	Temperature (°C)	Salinity	Depth (m)
524	2.78	34.46	1173
528	2.59	34.49	1186

Table 4. CTD measurements at both study areas

5. Results and Discussion

5.1 Oxygenation and pH

Measurements of bottom water oxygenation at both sites reveal surprisingly high values. With

an oxygenation of 191±6 µmol/l (calculated for the 5 mm of bottom water overlying the sediment-water interface), oxygen content at the non-seep site is lower compared to the South Colony Area (317±5 µmol/l) (Fig. 4). As far as bottom water oxygenation at Calyptogena site (measured with in situ methods) are supposed to be very low (~50 µmol/l, personal communication, Oguri K.), we think that our measurements of bottom water oxygenation are unreliable. Erroneous values are probably related to logistical problems (timing lag between core recovery and oxygen measurements aboard ship or contamination by well-oxygenated water). In terms of pH, our measurements may be also corrupted by above-mentioned logistical problems. If we consider that the effect of putative logistical was minor on pore water chemistry, we can try to interpret with utmost cares our data. In the South Colony Area, pH is relatively constant along the sediment core with a mean value of 7.71 ±0.04 (n = 10). Rathburn et al. (2003) observed a sharp increase of pH (and alkalinity) below the sediment-water interface in clam fields where bacterially-mediated methane oxidation (and related sulfate reduction) is effective. Conversely, our pH observations in March 2006 plead for a lack of methane oxidation in the upper part of the sediment, and perhaps the absence of rising-up methane-rich fluid at our site. In the non-seep area, pH increases more or less gradually with sediment depth, from a lower value of 7.45 at the sediment-water interface to 7.72 at 10.5 cm depth. The mean value is only 7.65 ±0.10 (n = 12). Identical observations were realized by Rathburn et al. (2003) in non-seep environments close to bacterial mat and clam fields.

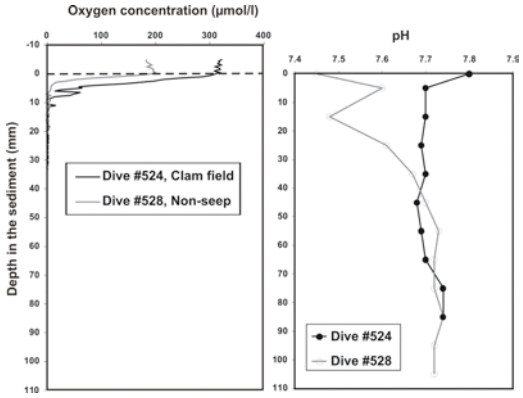

Fig. 4 Oxygen concentration and pH in the sediment at both sites (“ The South Colony Area” with clam field and the non-seep site).

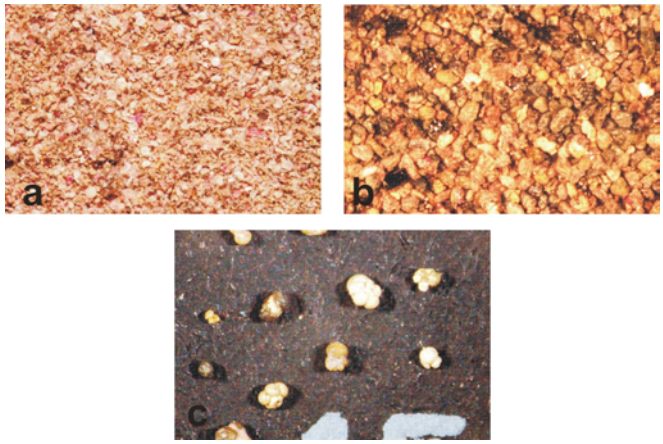

Fig. 5a-c Sieve residues (>32 µm, 0-0.5 cm interval, split ½) for both cores 528-mc16 (a)

and 524-mc4 (b). Similar magnification (x25) was used for both photographs c. Photograph of glauconitic inner moulds of planktonic foraminifera picked in core 524-mc4 (magnification x35).

5.2 Live and dead foraminifera

5.3.1 Foraminiferal assemblage in the non-seep area

The investigation of the 0-0.5 cm interval (split ½) has revealed very interesting features. The live (Rose-Bengal stained) foraminiferal fauna is poorly diverse (only 12 taxa) and presents relatively low density (561 individuals/50cc) (Table 5). There is no living calcareous species. Only a mixture of agglutinated and membranous taxa composes the living fauna. Recurvoides contortus is the major species (44.7%) (Plate 1). Cribrostomoides sp.1 and Recurvoidella parkerae are other dominant taxa (10.7% and 16.5%, respectively) (Plates 1 and 2). There are also very fragile membranous foraminifera (named taxon sp.1, 12.6%). As far as the samples were dried, the preservation of this soft-shelled taxon is not really satisfying, and its identification was problematic. It is impossible to detect aperture(s) and inner structure(s). However, individuals are characterized by flat transparent membranes where pinkish discoid protoplasm is clearly visible.

Following the observations by Akimoto et al. (1994), we would expect to find living (and dead) faunas enriched with Bulimina aculeata and Chilostomella ovoidea. Both taxa were recorded as thriving preferentially in non-seep fine sediments close to vesicomyid colonies, off Hatsushima (Akimoto et al., 1994). Surprisingly, we have not found these species in our non-seep area. Furthermore, the absolute lack of living calcareous individuals is questionable. Heinz et al. (2005) have already recorded such agglutinated community at a non-seep station from Hydrate Ridge (rich in ?Spiroplectammina biformis). They suggested that such fauna could be related to diffuse and cryptic methane seepage in the non-seep environs. In our study area, the exclusive occurrence of agglutinated and membranous taxa may be related to the unfavorable geochemical conditions prevailing at this site. Low pH values (7.45-7.60) in the first cm of sediment may indicate indeed relatively corrosive pore water that may preclude calcification processes. In all cases, only agglutinated taxa are obviously able to thrive in the topmost sediment of this non-seep environment. Low diversity, low density and strong dominance of some species (Recurvoides contortus and Recurvoidella parkerae) may suggest a non-equilibrium fauna surviving in stressing conditions (Alve, 1999). Another explanation for the absence of calcitic species in the 0-0.5 cm interval may be that calcareous taxa are only present in the deeper sediment layers of the sediment and not in the topmost part of the core. Rathburn et al. (2003) have already described erratic vertical distribution of calcareous living foraminifera in seep area, with many species presenting deep infaunal microhabitat. For instance, Tsuchiya M. has found Chilostomella ovoidea related DNA in the topmost first cm of sediment from our non-seep area (unpublished data), suggesting the presence of calcitic taxa.

Dead fauna is also really intriguing (Table. 5). Once again, we did not find any calcareous foraminifera. The absence of calcareous taxa suggests once again the impact of acidic conditions prevailing in the topmost sediment. 99% of dead assemblage is composed of agglutinated species. Recurvoidella parkerae is the predominant taxon (24.3%), followed by Ammoglobigerina globigeriniformis and Textularia kattegatensis (Plates 1 and 2). The density of dead fauna (364 individuals/50cc) is lower than the living one, what suggests the importance of taphonomic loss affecting the agglutinated foraminiferal group.

5.3.2 Foraminiferal assemblage at the South Colony Area

Sieve residues (>32 µm) revealed coarse sediment (Fig. 5b). Many angular minerals belonging to

sand size class are detectable. We have recorded only few biogenic remains, only rare diatom frustules. Noticeably, glauconitic inner moulds of planktonic foraminifera are also present (Fig. 5c, Plate 2). Glauconite is an autigenic mineral generally formed in reducing conditions prevailing in outer-shelf and upper-slope sediment. Yamaoka et al. (1999) reported dense clouds of suspended particles at benthic boundary layer of the " Real-time Deep-sea floor Observatory" very close to our both study areas. They suggested the occurrence of strong bottom currents, really active in spring season. Therefore, the upper sediment from the South Colony Area may be composed by sandy material reworked by putative hydrosedimentary downslope transport (nepheloid bottom layers).

Core 528-mc16, Dive #528	Living (Rose-Bengal stained) fauna Absolute density (split 1/2)	%	Dead fauna Absolute density (split 1/2)	%
Agglutinated species				
Indet.			3	4.3
Agglutinated taxon sp.1	2	1.9		
Adercotryma sp.			1	1.4
Ammodiscus sp.	1	1.0		
Ammoglobigerina globigeriniformis	3	2.9	7	10.0
Cribrostomoides sp.1	11	10.7	3	4.3
Cribrostomoides sp.2	3	2.9		
Crisbrostomoides scitulus	4	3.9		
Eggerella spp.	2	1.9	4	5.7
Glomospira sp.			1	1.4
Haplophragmoides bradyi			2	2.9
Lepidodeuterammina sp.			1	1.4
Lepidoparatrochammina sp.			4	5.7
Lepidoparatrochammina charlottensis			1	1.4
Recurvoidella parkerae	17	16.5	17	24.3
Recurvoides sp.			1	1.4
Recurvoides contortus	46	44.7	8	11.4
Reophax cf. dentaliniformis			3	4.3
Reophax cf. scorpiurus	1	1.0		
?Textularia sp.			1	1.4
Textularia kattegatensis			8	11.4
Trochammina pacifica			5	7.1
Membranous species				
Taxon sp.1	13	12.6		
Bathysiphon sp. fragment	1			
Total	**103**	**100**	**70**	**100**
Taxa number	**12**		**16**	

Table 5. Census data for live (Rose-Bengal stained) and dead foraminifera in the 0-0.5 cm interval (split ½).

The investigation of the 0-0.5 cm interval (split ½) has revealed only 3 dead foraminiferal invididuals (2 Ammoglobigerina globigeriniformis + 1 ?Marginulina sp.) (Plate 1). No living (Rose-Bengale stained) foraminifera were found. The inspection of " homogenization sample" (split 1/32) revealed no foraminifera. Moreover, we did not find Bulimina striata and Rutherfordoides cornuta which were described as abundant in Calyptogena colonies and related cold methane- and sulfide-rich seepage off Hatsushima (Akimoto et al., 1994). Now again, it is very difficult to explain the absence of benthic foraminifera in the upper sediment. The absence of living and dead fauna may be related to a catastrophic benthic storm related to hydrosedimentary processes. The coarse sediment may also suggest active winnowing (1) by strong bottom currents or (2) by strong vertical seepage from the deeper sediment.

6. Summary

This preliminary investigation of the upper sediment from both sites (a clam field and a non-seep area) off Hatsushima revealed different biotopes and a strong contrast concerning foraminiferal assemblages.

(1) The core collected in the South Colony Area is characterized by coarse sediment (predominantly sand-size class) with some glauconitic inner moulds of planktonic foraminifera. It may be related (1) to the deposition of reworked material

coming from shallower depth, (2) active winnowing by strong bottom currents, (3) active winnowing by vertical seepage from the deeper sediment.

(2) The foraminiferal assemblage from the non-seep area is characterized by agglutinated taxa. Living fauna is poorly diverse and presents low standing stock. This may suggest unfavorable conditions prevailing at this site. The presence of acidic pore water (7.45-7.60) in the topmost sediment may explain the absence of calcareous species.

(3) No living foraminifera and only few dead foraminifera were found in the uppermost sediment from the Calyptogena site. Such a foraminiferal desert may echo a recent benthic storm related to complex hydrosedimentary processes prevailing at this place.

Finally, a strong spatial variability is recorded between both sites. However, the absence of replicates for both zones and the only investigation of the 0-0.5 cm interval for benthic foraminifera make it very hard to establish firm conclusions from our foraminiferal and geochemical data. Further investigations are required to enlighten the fascinating environmental variability recorded in the cold-seep areas off Hatsushima.

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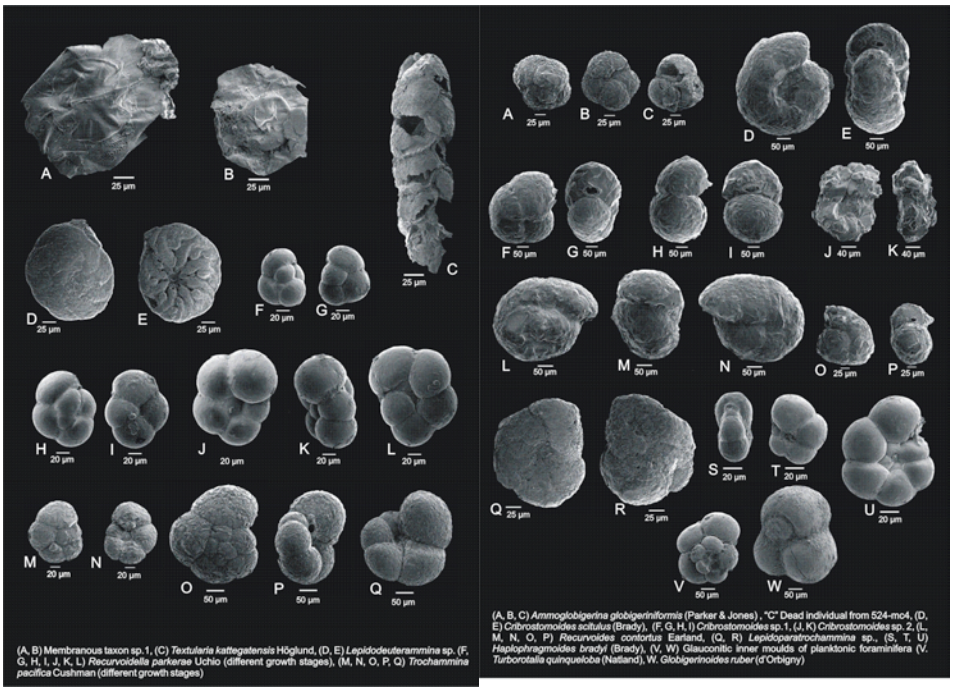

Plate 1. Main foraminiferal species (living and dead) found in non-seep areas

Plate 2. Main foraminiferal species (living and dead) found in non-seep areas

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鯨骨生物群集に関する微生物学的研究

(1)「鯨骨生物群集域の微生物多様性と変遷」

宮崎征行，長濱統彦，能木裕一（JAMSTEC）

柱状採泥器及び無菌採泥器より得られた海底堆積物から直接 DNA を抽出し，Archae と Bacteria をターゲットとした PCR クローンを基にした多様性解析を行い，海洋投入後 48 ヶ月目の微生物多様性の構成種を明らかにし，過去のデータと比較することにより変遷を推定する．また，好気／嫌気条件下で，細菌の分離培養を試みる．得られた細菌は各種に適切な手法により同定する．

(2)「鯨骨生物群集域における真菌の分離」

長濱統彦，長野由梨子，宮崎征行，能木裕一（JAMSTEC）

柱状採泥器及び無菌採泥器より得られた海底堆積物から真菌類の分離培養を試みる．各条件下において，平板および集積培養を実施する．得られた真菌類は各種に適切な手法により種同定する．また各種有用酵素生産性についても解析を行う．

Long-term environmental monitoring

Kazumasa Oguri, Tahashi Toyofuku, Christoph Fontanier, Hidetaka Nomaki, Saburo Sakai, Ryoichi Iwase, Hiroshi Kitazato et al.

By 15th/Jan/2010, 6240 batches of the measurements (56160 profiles in total) of the two dimensional O_2 profiles will be obtained. The whole system and the cable are recovered at NT10-01 cruise scheduled on Jan/2010. After the recovery, the following studies shall be carried out.

(1) Calculations of " O_2 images" and the corresponding grayscale profile images.

(2) Using with the data, both short and long time fluctuations of O_2 distributions (time-series changes in O_2 penetration depth, O_2 uptakes, biological activities and so on) at SWI are investigated to compare with the data from reference O_2 sensor, horizontal current speed, tide and transmission obtaining at Hatsushima station. As well, oceanographic data obtained by other studies (eg, satellite data) will be attempted to compare the long term O_2 fluctuations at SWI.

(3) Technical improvements: Monitoring of voltage and electric current at Hatsushima land station to check that the optode system is functional. Check the equipments and the modules. If any defections or troubles may occur, repair and improve the points.

Future studies for cruise NT09-06 (Florence ,Nunes Jorge, Fujiwara, Kawato, Miyazaki, Nagahori, Shinozaki)

During this cruise, bones with biological assemblages, sediments, water and plankton samples were collected around the carcasses of 2 sperm-whales at different stage of their degradation at a depth of 925 meters. This gave us the opportunity to evaluate and compare colonization and succession events occurring after dead whales sink on the ocean floor. The first whale (called " Sagami") was implanted in April 2005 and was 49 months old during the cruise. The second whale (called " Satomi") was implanted in December 2008, and was 5 months old.

Both carcasses were implanted about 100 meters apart, which would potentially allow the populations colonizing the older carcass to be a source of colonist larvae for the new carcass. We already observed a succession of species on the old carcass since its implantation. For example, in the polychaete Osedax, 8 species successively colonized the bones. Was that succession due to different physiological ability of the different Osedax species and their bacterial symbionts to colonize bones at different degradation stages? Or is the observed succession due to different dispersal strategies (the species with the highest dispersal potential arrive first)? With the implantation of a new carcass, close to the oldest one, we will be able to answer such questions. If the early colonists found on the new carcass are similar to the ones that were found at a similar degradation stage on the old carcass, the succession is probably best explained by the existence of strict physiological requirement for each species. On the contrary, if the species found on the new carcass are similar to the colonist found on the old carcass at the same moment while both carcass are at very different degradation stages, then the proximity of a source population would have favored the colonization of the new whale, whatever the species. In that case, dispersal abilities probably play a strong role in determining colonization succession. We will now use a barcoding analysis to compare the colonization patterns of both carcasses, mostly on the Osedax model. Bacterial symbionts will also be identified in order to better understand the metabolic potential of each species. Correlations between bacterial symbionts, invertebrate hosts, and bone degradation stages may help us understand the evolutionary mechanisms of symbioses associated with sunken whale carcasses.

Some of the collected Osedax specimens have been kept alive, and development will be studied in the laboratory. Specifically, temperature and pressure tolerance of the

embryonic and larval stages will be assessed in order to understand potential for colonization of these species. Symbiont acquisition during development will also be investigated.

Other environmental data (sulphide concentrations in sediments, microbial communities in sediments, infaunal sediment communities, planktonic larvae around carcasses…) were also assessed and will be compared with data previously obtained for the older carcass.

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Notice on Using

Appendix

I. List of samples

I-1. Mega fauna

Page 1. On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																				
On board No.	Box, MT-	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Preservation	Remarks
HD973-	S	01	01	Calyptogena okutanii	シマイシロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	02	Calyptogena okutanii	シマイシロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	03	Calyptogena okutanii	シマイシロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	04	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	05	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	06	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	07	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	08	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1	-80		Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol), gonad(Bouin), Yoshida(gill(-80))
HD973-	S	02	01	Bathyacmaea nipponica (shells only)	ワタゾコシロアミガサガイモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	2	Dry sample	Dry	
HD973-	S	02	02	Bathyacmaea nipponica (soft tissues with shells)	ワタゾコシロアミガサガイモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	7	-80	Frozen	
HD973-	S	03		Polychaeta sp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	4	EtOH	EtOH at RmTemp	
HD973-	S	04		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	2	EtOH	EtOH at RmTemp	
HD973-	S	05		Calyptogena spp. (pair of shells)	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	1.5	Dry sample	Dry	
HD973-	S	06		Conchocela bisecta (paired shells)	オウナガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	2	Dry sample	Dry	
HD973-	S	07		Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	2	EtOH	EtOH	
HD973-	S	08		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-97	N	139	13-34	E	2009.4.25	7	EtOH	EtOH	
HD973-	MT	01		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-970	N	139	13-337	E	2009.4.25	20	EtOH		
HD973-	MT	02		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-970	N	139	13-337	E	2009.4.25	30	10% Formalin		
HD973-	MT	03		Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	853	35	00-970	N	139	13-337	E	2009.4.25	1	-80		Seo(mantle(ethanol), gonad(Bouin),shell(Dry))

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																	
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation
HD974-	S	01		Sea weed	海藻		Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	4℃
HD974-	S	02		Sea weed	海藻		Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	4℃
HD974-	S	03		Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ		Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	4℃
HD974-	S	04		Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	10% formalin
HD974-	S	05		Phymorhynchus buccinoides	ツブナリシャジク		Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	4℃
HD974-	S	06		Phymorhynchus buccinoides egg capsule	ツブナリシャジク卵塊		Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	4℃
HD974-	S	07		Phymorhynchus buccinoides	ツブナリシャジク	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	4	-80
HD974-	S	08		Zoarcidae gen. sp.	ゲンゲ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	2	-80
HD974-	S	09		Paralomis multispina	エゾイバラガニ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	3	-80
HD974-	S	10		Buccinidae gen sp.	エゾバイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	1	-80
HD974-	S	11		Small Bivalvia	小型二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	EtOH
HD974-	S	12		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	2	-80
HD974-	S	13		Pycnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	3	EtOH
HD974-	S	14		Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	4	EtOH
HD974-	S	15		Unidentified	未同定種	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	EtOH
HD974-	S	16		Buccinidae gen sp.	エゾバイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	17		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	18		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	-80
HD974-	S	19		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	10	-80
HD974-	S	20		Porifera sp.	カイメン類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	21		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	10% formalin
HD974-	S	22		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	EtOH
HD974-	S	23		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	-80
HD974-	S	24		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	-80
HD974-	S	25		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	EtOH
HD974-	S	26		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	many	10% formalin
HD974-	S	27	01	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	27	02	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	27	03	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	27	04	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	27	05	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	27	06	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	-80
HD974-	S	27	07	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	08	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	09	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	10	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	11	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	12	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	13	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	14	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	15	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	16	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	17	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	18	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	19	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	20	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																	
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation
HD974-	S	27	21	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	22	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	23	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	24	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	25	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	26	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	27	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	28	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	29	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	30	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	31	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	32	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	33	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	34	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	35	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	36	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	37	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	S	27	38	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-174	N	139	13-479	E	2009.4.25	1	Bouin
HD974-	B	01	01	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	02	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	03	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	04	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	05	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	06	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	07	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	08	Calyptogena soyoae	シロウリガイ		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	09	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	10	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	11	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	12	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	13	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	14	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	15	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	16	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	17	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	18	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	19	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	20	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	21	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	22	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	23	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	24	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	25	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	26	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	27	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																	
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation
HD974-	B	01	28	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	29	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	30	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	31	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	32	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	33	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	34	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	35	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	36	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	37	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	01	38	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	B	02		Sipunculoida sp.	ホシムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	1	-80
HD974-	B	03		Sipunculoida sp.	ホシムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	1	EtOH
HD974-	B	04		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	20	-80
HD974-	B	05		Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	3	-80
HD974-	B	06		Nicomache ohtai	オオタギボシタケフシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	3	-80
HD974-	B	07		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	many	10% Formalin
HD974-	B	08		Thyasiridae gen sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	1	EtOH
HD974-	B	09		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	13	EtOH
HD974-	B	10		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-10	N	139	13-51	E	2009.4.25	2	EtOH
HD974-	MT	01	1	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	MT	01	2	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	MT	01	3	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	MT	01	4	Calyptogena okutanii / soyoae	シロウリガイ類		Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-099	N	139	13-514	E	2009.4.25	1	-80
HD974-	S	28		Phymorhynchus buccinoides	ツブナリシャジク	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	many	10% Formalin
HD974-	B	29		Oenopota sagamiana	サガミマンジガイ	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-185	N	139	13-489	E	2009.4.25	many	10% Formalin
HD974-	B	30		Gastropoda egg capsule	腹足類卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	many	EtOH
HD975-	B	30		Gastropoda egg capsule	腹足類卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-18	N	140	13-49	E	2009.4.26	many	alive
HD974-	B	31		Phymorhynchus buccinoides egg	ツブナリシャジク卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	many	10% Formalin
HD975-	B	31		Phymorhynchus buccinoides egg	ツブナリシャジク卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-18	N	140	13-49	E	2009.4.26	many	alive
HD974-④	B	32		Bathymodiolus platifrons /	シンカイヒバリガイ類	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-17	N	139	13-48	E	2009.4.25	12	-30
サンプル番号が同じものは、同じところで採集されて、同じもの（グループ）として同定されたあと分けて処理されたもので、serial #はその処理が異なるものを区別するための番																		

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial#	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD975-	S	01	01	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	02	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	03	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	04	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	05	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	06	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	07	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	08	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Yoshida(gill(-80)), Seo(mantle(ethanol))
HD975-	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Hori(gill(-80)),Seo(mantle(ethanol))
HD975-	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	15	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	16	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	17	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	18	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	19	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	20	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	21	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	22	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)shell(Dry)), Seo(mantle(ethanol))
HD975-	S	01	23	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	24	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	25	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	26	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																	
On board No.	Event	sample #	Serial#	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD975-	S	01	27	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	28	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	29	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	30	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	31	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	32	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	33	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	34	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD975-	S	01	35	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad, mantle(ethanol)), Seo(mantle(ethanol))
HD975-	S	01	36	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad, mantle(ethanol)), Seo(mantle(ethanol))
HD975-	S	01	37	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	Imai(foot(-80), gonad, mantle(ethanol)), Seo(mantle(ethanol))
HD975-	S	02		Unidentified	未同定種	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	2	EtOH	For Taxonomy
HD975-	S	03		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	EtOH	For Taxonomy
HD975-	S	04		Zoarcidae gen. sp.	ゲンゲ科魚類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	stable isotope analysis
HD975-	S	05		Asteroidea sp.	ヒトデ腕1本	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	stable isotope analysis
HD975-	S	06		Polyplacophora sp.	ヒザラガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	EtOH	For Taxonomy
HD975-	S	07		Picuogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	4 deg. C	Fungi analysis by Nagano
HD975-	S	08		Polychaeta sp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	10% form	Taxonomy
HD975-	S	09		Polychaeta sp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	10		Margarites shinkai	シンカイイタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	9	-80	stable isotope analysis
HD975-	S	11		Gastropoda spp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	7	EtOH	Taxonomy (by Okutani)
HD975-	S	12		Thyasiridae spp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	4	-80	stable isotope analysis
HD975-	S	13		Thyasiridae spp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy by Okutani
HD975-	S	14		small Thyasiridae spp.	小型ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy by Okutani

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial#	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD975-	S	15		small Thyasiridae spp.	小型ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	16		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	4 deg. C	Fungi analysis by Nagano
HD975-	S	17		Picnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy
HD975-	S	18		Picnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	19		Isopoda sp.	等脚類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	20		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	21		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy
HD975-	S	22		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	4 deg. C	Fungi, Nagano
HD975-	S	23		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	24		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy
HD975-	S	25		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	10% Forr	Taxonomy
HD975-	S	26		Sea weed	海藻	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1?	4 deg. C	Fungi, Nagano
HD975-	S	27		Ophiuroidea spp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	?	4 deg. C	Fungi, Nagano
HD975-	S	28		Ophiuroidea spp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	29		Ophiuroidea spp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy
HD975-	S	30		Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	4	-80	stable isotope analysis
HD975-	S	31		Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	4	-80	stable isotope analysis
HD975-	S	32		Bathymodiolus spp.	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy
HD975-	S	33		Calyptogena sp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	4 deg. C	Fungi, Nagano
HD975-	S	34		Phyllocarida sp.	コノハエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	5	EtOH	Taxonomy
HD975-	S	35		Amphipoda spp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	-80	stable isotope analysis
HD975-	S	36		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1?	4 deg. C	Fungi, Nagano
HD975-	S	37		Amphipoda spp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	Many	EtOH	Taxonomy
HD975-	S	38		Bivalvia spp.	二枚貝の未同定種	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	2	EtOH	Taxonomy (Okutani)
HD975-	S	39		Calyptogena spp.	シロウリガイの1種未同定種	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy (Okutani)
HD975-	S	40		Polychaeta sp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	many	EtOH	Taxonomy

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																	
On board No.	Event	sample #	Serial#	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD975-	S	41		Neptunea acutispiralis	オシロイエゾボラ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	2	-80	stable isotope analysis
HD975-	S	42		Paralomis multispina	エゾイバラガニ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-96	N	139	13-32	E	2009.4.26	1	-80	stable isotope analysis
HD975-	S	43	01	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	02	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	03	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	04	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	05	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	06	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	07	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	08	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	09	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	10	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	11	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	12	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD975-	S	43	13	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	14	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	15	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))

	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board	Event	sample #	Serial#	Species Name	Japanease Name	Identified	Locality Site	Locality Area	Depth	Lat	Lat min	N/S	Long deg	Long min	E/W	Date	No.of	Fixation	Remarks
HD975-	S	43	16	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	17	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	18	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	19	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	20	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	21	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	43	22	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD975-	S	44	01	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD975-	S	44	02	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD975-	S	44	03	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD975-	S	44	04	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD975-	S	44	05	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD975-	S	44	06	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD975-	S	45		Neptunea acutispiralis	オシロイエゾボラ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-959	N	139	13-318	E	2009.4.26	1	-80	Stable isotope analysis

Page 1. On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#

Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)

On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD976-	S	01	01	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD976-	S	01	02	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD976-	S	01	03	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD976-	S	01	04	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	05	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	06	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	07	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	08	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde), gill(-80)), Seo(mantle(ethanol), gonad(Bouin))
HD976-	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD976-	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD976-	S	02		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	802	35	00-935	N	139	13-222	E	2009.4.27	2	10% Formalin	For taxonomy
HD976-	S	03		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	802	35	00-935	N	139	13-222	E	2009.4.27	many	10% Formalin	For taxonomy
HD976-	S	04		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	802	35	00-935	N	139	13-222	E	2009.4.27	7	99.5% EtOH	For taxonomy
HD976-	S	05		Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	802	35	00-935	N	139	13-222	E	2009.4.27	3	99.5% EtOH	For taxonomy
HD976-	S	06		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	802	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Stable isotope analysis
HD976-	S	07		Phyllocarida sp.	コノハエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	802	35	00-935	N	139	13-222	E	2009.4.27	many	-80	Stable isotope analysis

Page 1. On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#

Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)

On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD976-	MT	01		Polychaeta sp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	820	35	00-935	N	139	13-222	E	2009.4.27	many	-80	Stable isotope analysis
HD976-	MT	02		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	820	35	00-935	N	139	13-222	E	2009.4.27	many	99.5% EtOH	For taxonomy
HD976-	MT	03		Phyllocarida sp.	コノハエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	820	35	00-935	N	139	13-222	E	2009.4.27	many	10% Formalin	For taxonomy
HD976-	MT	04		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	820	35	00-935	N	139	13-222	E	2009.4.27	3	10% Formalin	For taxonomy
HD976-	MT	05		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	820	35	00-935	N	139	13-222	E	2009.4.27	1	99.5% EtOH	For taxonomy
HD976-	MT	06	01	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	99.5% EtOH	Nakamura(all(99.5% ethanol)))
HD976-	MT	06	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Fujikura
HD976-	MT	06	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Fujikura
HD976-	MT	06	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	803	35	00-935	N	139	13-222	E	2009.4.27	1	-80	Fujikura

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD977	S	01	01	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	02	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD977	S	01	03	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	04	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	05	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	06	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD977	S	01	07	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	08	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)),Hogo(gill(-80,CA activity)), Seo(mantle(ethanol), gonad(Bouin))
HD977	S	01	15	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	16	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	17	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD977	S	01	18	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Tame(blood experiment)
HD977	S	01	19	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Tame(blood experiment)
HD977	S	01	20	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	854	35	00-944	N	139	13-305	E	2009.4.27	1	-80	Seo(mantle(ethanol), gonad(Bouin))

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD977	S	02	01	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD977	S	02	02	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD977	S	02	03	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD977	S	02	04	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(-80),gill(-80),adductor muscle(-80), gonad(Bouin))
HD977	S	03	01	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	02	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	03	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	04	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	05	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	06	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	07	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	03	08	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-952	N	139	13-321	E	2009.4.27	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD977	S	04	01	Gastropoda sp. (Provanna like)	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	7	99.5% Et	For Taxonomy (Okutani)
HD977	S	04	02	Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	2	-80	Stable isotope analysis
HD977	S	05		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	8	10% Form	For Taxonomy (Okutani)
HD977	S	06	01	Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	5	-80	Stable isotope analysis
HD977	S	06	02	Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	4	99.5% Et	For Taxonomy (Okutani)
HD977	S	07	01	Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	10% Form	For Taxonomy (Okutani)
HD977	S	07	02	Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	-80	Stable isotope analysis
HD977	S	08		Gastropoda sp. (small)	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	99.5% Et	For Taxonomy (Okutani)

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
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On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD977	S	09	01	Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	5	-80	Stable isotope analysis
HD977	S	09	02	Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	99.5% Et	For Taxonomy
HD977	S	10		Paralomis multispina	エゾイバラガニ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	1	10% Forn	For Taxonomy
HD977	S	11		Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	4	-80	Stable isotope analysis
HD977	S	12		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	4	-80	Stable isotope analysis
HD977	S	13		Gastropoda sp. (small)	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	99.5% Et	For Taxonomy
HD977	S	14	01	Pycnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	-80	Stable isotope analysis
HD977	S	14	02	Pycnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	99.5% Et	For Taxonomy
HD977	S	15		Isopoda sp.	ミズムシ（等脚類）	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	-80	Stable isotope analysis
HD977	S	16	01	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	1	-80	Stable isotope analysis
HD977	S	16	02	Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	10% Forn	For Taxonomy
HD977	S	16	03	Bathymodiolus spp. small	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	99.5% Et	For Taxonomy
HD977	S	16	04	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	4	99.5% Et	For Taxonomy
HD977	S	17		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	10% Forn	For Taxonomy
HD977	S	18		Polycladida sp.	ヒラムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	1	99.5% Et	For Taxonomy
HD977	S	19		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	5	99.5% Et	For Taxonomy
HD977	S	20		Calyptogena spp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	99.5% Et	For Taxonomy
HD977	S	21		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	855	35	00-947	N	139	13-330	E	2009.4.27	many	10% Forn	For Taxonomy
HD977	B	01	01	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	many	alive	For Biochemistry in Jimbo Lab
HD977	B	01	02	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	10% Forn	For Protist Taxonomy in Canada
HD977	B	01	03	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	99.5% Et	For Protist Taxonomy in Canada

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD977	B	01	04	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum & trophosome (Stable isotope analysis)
HD977	B	01	05	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	trophosome only (Stable isotope analysis)
HD977	B	01	06	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum only (Stable isotope analysis)
HD977	B	01	07	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum & trophosome (Stable isotope analysis)
HD977	B	01	08	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum & trophosome (Stable isotope analysis)
HD977	B	01	09	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	trophosome only (Stable isotope analysis)
HD977	B	01	10	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	trophosome only (Stable isotope analysis)
HD977	B	01	11	Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	4 to 5	70% EtOH	Sheath only (For Chitin analysis)
HD977	B	02	01	Alaysia sp.	アレイズハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	many	alive	For Biochemistry in Jimbo Lab
HD977	B	02	02	Alaysia sp.	アレイズハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum & trophosome (Stable isotope analysis)
HD977	B	02	03	Alaysia sp.	アレイズハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum & trophosome (Stable isotope analysis)
HD977	B	02	04	Alaysia sp.	アレイズハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	853	35	00-944	N	139	13-305	E	2009.4.27	1	-80	gill-vestimentum & trophosome (Stable isotope analysis)

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#

Event(Box, MT-core, MB(MBARI)-core, Slarp-gun

On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD978	S	01	01	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD978	S	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD978	S	01	03	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD978	S	01	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD978	S	01	05	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD978	S	01	06	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD978	S	01	07	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde),gill(-80)), Seo(mantle(ethanol), gonad(Bouin))
HD978	S	01	08	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	4% Paraformaldehyde	Nakamura(all(palform)))
HD978	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD978	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD978	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD978	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD978	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD978	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-502	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD978	S	02		Scaphopoda sp.	ツノガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	1	99.5% EtOH	For Taxonomy
HD978	S	03		Unidentified	未同定種	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	2	99.5% EtOH	For Taxonomy
HD978	S	04		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	4	10% Formalin	For Taxonomy

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD978	S	05		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	99.5% EtOH	For Taxonomy
HD978	S	06		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	10% Formalin	For Taxonomy
HD978	S	07		Isopoda sp.	ミズムシ（等脚類）	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	3	10% Formalin	For Taxonomy
HD978	S	08		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	1	99.5% EtOH	For Taxonomy
HD978	S	09	01	Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	4	10% Formalin	For Taxonomy
HD978	S	09	02	Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	3	-80	For stable isotope analysis
HD978	S	10		Bivalvia (small) sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	99.5% EtOH	For Taxonomy
HD978	S	11		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	99.5% EtOH	For Taxonomy
HD978	S	12	01	Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	-80	For stable isotope analysis
HD978	S	12	02	Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	10% Formalin	For Taxonomy
HD978	S	12	03	Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	Buin fixative	For Taxonomy
HD978	S	12	04	Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	many	99.5% EtOH	For Taxonomy
HD978	B	13	1	Gastropod egg capsule	腹足類卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	100	10% Formalin	Watanabe
HD978	B	13	2	Gastropod egg capsule	腹足類卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.28	100	99.5% EtOH	Watanabe
HD979	B	13	3	Gastropod egg capsule	腹足類卵塊	Watanabe Hiromi	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.4.29	101	alive	Watanabe

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD979	S	01	01	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Yoshida(gonad(palform, glutaraldehyde)), Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	05	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	06	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	07	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	08	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	09	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	10	Calyptogena soyoae	シロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	11	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	12	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	15	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	16	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	17	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	18	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	19	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	20	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	21	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	22	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD979	S	01	23	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	24	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	25	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	26	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	27	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	28	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	29	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	30	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD979	S	01	31	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD979	S	01	32	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD979	S	01	33	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD979	S	01	34	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD979	S	01	35	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Seo(mantle(ethanol), gonad(Bouin),shell(Dry))
HD979	S	02		Polynoidae sp.	ウロコムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	-80	Stable isotope analysis
HD979	S	03		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	many	-80	Stable isotope analysis
HD979	S	04		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	4	-80	Stable isotope analysis
HD979	S	05		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	3	-80	Stable isotope analysis
HD979	S	06		Paralomis multispina	エゾイバラガニ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	2	10% Formalin	Taxonomy
HD979	S	07		Provanna glaba	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	many	-80	Stable isotope analysis
HD979	S	08		Gastropoda sp. small	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	2	99.5% EtOH	Taxonomy (Dr. Okutani)

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD979	S	09		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	2	99.5% EtOH	Taxonomy (Dr. Okutani)
HD979	S	10		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	many	10% Formalin	Taxonomy
HD979	S	11		Polychaeta? sp. attaching to the tube of Lamellibrachia sp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	many	99.5% EtOH	Taxonomy
HD979	S	12		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	2	99.5% EtOH	Taxonomy (Dr. Okutani)
HD979	S	13		Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	99.5% EtOH	Taxonomy (Dr. Okutani)
HD979	S	14		Calyptogena sp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	1	4% para-formialdehyde	Nakamura
HD979	S	15		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1176	35	00-092	N	139	13-516	E	2009.4.28	many	10% Formalin	Taxonomy

On board No.はHD-dive #-B(MT(MT-core), MB, B=Box, S-suction sampler)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD981-	B	01	01	Calyptogena okutanii	シロウリガイ類	Fujikura	Off Hatsuhima	Sagami	858	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	B	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	B	01	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	B	02		Calyptogena sp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Stable Isotope analysis
HD981-	B	03		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy
HD981-	B	04		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	2	10% formalin	For Taxonomy
HD981-	B	05		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	10% formalin	For Taxonomy
HD981-	B	06		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	10% formalin	For Taxonomy
HD981-	B	07		Polychaeta sp. (on Bathymodiolus mussel shell)	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	99.5% EtOH	For Taxonomy
HD981-	B	08	01	Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy
HD981-	B	08	02	Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	B	09		Lamellibrachia sp.(sagami)	サガミハオリムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Yoshida For CA activity
HD981-	S	01	01	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	S	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment), Nakamura(gill (experiment))
HD981-	S	01	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	S	01	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	S	01	05	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	S	01	06	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	S	01	07	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment)
HD981-	S	01	08	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hori (gill(-80), gonad(-80,palform), mantle(-80)), Yoshida(gonad(palform, glutaraldehyde)), Seo (shell(Dry))
HD981-	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hori (gill(-80), gonad(-80,palform), mantle(-80))
HD981-	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hori (gill(-80), gonad(-80,-4,palform), mantle(-80))

On board No.はHD-dive #-B(MT(MT-core), MB, B=Box, S-suction sampler)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD981-	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hori (gill(-80), gonad(-80), mantle(-80))
HD981-	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hori (gill(-80), gonad(-80), mantle(-80))
HD981-	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Nakamura (gill(experiment), mantle(-80),shell(Dry)),Tame(blood experiment), Seo(mantle(ethanol))
HD981-	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Nakamura (gill(experiment), mantle(-80),shell(Dry)),Tame(blood experiment), Seo(mantle(ethanol))
HD981-	S	01	15	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Nakamura (gill(experiment), mantle(-80),shell(Dry)), Seo(mantle(ethanol))
HD981-	S	01	16	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Nakamura
HD981-	S	01	17	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Tame(blood experiment, mantle(-80),foot(-80),shell(Dry))
HD981-	S	02	01	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	02	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	03	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	04	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	05	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	06	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	07	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	08	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	09	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	10	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	11	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))

On board No.はHD-dive #-B(MT(MT-core), MB, B=Box, S-suction sampler)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD981-	S	02	12	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(adductor muscle(-80))
HD981-	S	02	13	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	14	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	15	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	16	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	17	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	18	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	19	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	20	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	21	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	22	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin))
HD981-	S	02	23	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	24	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	25	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	26	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	27	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	28	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))

On board No.はHD-dive #-B(MT(MT-core), MB, B=Box, S-suction sampler)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD981-	S	02	29	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	30	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	31	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(adductor muscle(-80))
HD981-	S	02	32	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(adductor muscle(-80))
HD981-	S	02	33	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(adductor muscle(-80))
HD981-	S	02	34	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(adductor muscle(-80))
HD981-	S	02	35	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(adductor muscle(-80))
HD981-	S	02	36	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	37	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Imai(foot(-80), gonad(-80), mantle(-80)), Takahashi(mantle(Bouin),gill(-80),adductor muscle(-80), gonad(Bouin),shell(Dry))
HD981-	S	02	38	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Takahasi (For Taxonomy)
HD981-	S	02	39	Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hongo (experiment)
HD981-	S	03		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	S	04	01	Provanna glaba	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	S	04	02	Provanna glaba	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	99.5% EtOH	For Taxonomy
HD981-	S	04	03	Provanna glaba	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy
HD981-	S	05		Bathymodiolus spp.	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	S	06		Polycladida sp.	ヒラムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	2	-80	Stable Isotope analysis
HD981-	S	07		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	10% formalin	For Taxonomy
HD981-	S	08		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy
HD981-	S	09		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	4	-80	Stable Isotope analysis
HD981-	S	10		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	S	11		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy
HD981-	S	12		Pycnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy

On board No.はHD-dive #-B(MT(MT-core), MB, B=Box, S-suction sampler)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD981-	S	13		Phyllocarida sp.	コノハエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	S	14		Amphipoda sp.	ヨコエビ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	-80	Stable Isotope analysis
HD981-	S	15		Crustacean spp.	甲殻類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	many	10% formalin	For Taxonomy
HD981-	S	16		Actiniaria sp.	イソギンチャク類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	1	10% formalin	For Taxonomy
HD981-	S	17		Calyptogena spp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	858	35	-951.000	N	139	13-334	E	2029.4.29	13	-80	Stable Isotope analysis
HD981-	S	18		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	Yoshida(gill(experiment)), Seo(foot(70%EtOH),mantle(70%EtOH),shell(Dry),gonad(10% Formalin,gonad))
HD981-	S	19		Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hongo (experiment)
HD981-	S	20		Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Stable isotope analysis
HD981-	S	21		Bathymodiolus spp.	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	10	-80	Nakamura
HD981-	S	22		Bathymodiolus spp.	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	10	4% para-formialdehyde	Nakamura
HD981-	S	23		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	many	4% para-formialdehyde	Nakamura
HD981-	S	24		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	99.5% EtOH	For Taxonomy
HD981-	S	25		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	857	35	-951.000	N	139	13-334	E	2029.4.29	1	Dry	For Taxonomy
HD981-	S	26	01	Bathymodiolus	シンカイヒバリガ	Fujikura	Off Hatsuhima	Sagami	857	35	-951.000	N	139	13-334	E	2029.4.29	1	-80	Hongo (experiment)
HD981-	S	26	02	Bathymodiolus	シンカイヒバリガ	Fujikura	Off Hatsuhima	Sagami	857	35	-951.000	N	139	13-334	E	2029.4.29	10	alive	For experiments

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD982-	S	01		サンプルなし															
HD982-	S	02		サンプルなし															
HD982-	S	03		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima	Sagami	1171	35	00-076	N	139	13-481	E	2009.4.29	2	-80	Stable isotope analysis
HD982-	S	04		Buccinum sp.	エゾバイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	2	-80	Stable isotope analysis
HD982-	S	05	01	Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	many	99.5% EtOH	For Taxonomy
HD982-	S	05	02	Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	many	4% Paraformaldeh	For Taxonomy
HD982-	S	05	03	Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	many	-80	Stable isotope analysis
HD982-	S	05	04	Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	many	10% Formalin	For Taxonomy
HD982-	S	06		Sipunculoida sp.	ホシムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	-80	Stable isotope analysis
HD982-	S	07		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	many	10% Formalin	For Taxonomy
HD982-	S	08		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	2	10% Formalin	For Taxonomy
HD982-	S	09		Oenopota sagamiana	サガミマンジガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	10% Formalin	For Taxonomy
HD982-	S	10		Bivalvia sp. (unidentified)	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	99.5% EtOH	For Taxonomy
HD982-	S	11		Gastropoda sp.	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	5	99.5% EtOH	For Taxonomy
HD982-	S	12		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	many	10% Formalin	For Taxonomy
HD982-	S	13		Gastropoda sp. (unidentified)	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	99.5% EtOH	For Taxonomy
HD982-	S	14		Euphaucia sp.	オキアミ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	99.5% EtOH	For Taxonomy
HD982-	S	15		Bathymodiolus sp.	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	99.5% EtOH	For Taxonomy
HD982-	S	16		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	99.5% EtOH	For Taxonomy
HD982-	S	17		Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	2	99.5% EtOH	For Taxonomy
				Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	-80	Yoshida For CA activity
HD982-	S	18		Calyptogena spp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	31	-80	Stable isotope analysis
HD982-	MT	01		Calyptogena spp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-076	N	139	13-481	E	2009.4.29	1	-80	Stable isotope analysis

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat de	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD984-	B	01	01	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment), Nakamura (gill (experiment))
HD984-	B	01	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	01	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	01	05	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	01	06	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	01	07	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	01	08	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Tame (blood experiment)
HD984-	B	03		Buccinum sp.	エゾバイ属	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	B	04		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	10% Formalin	Taxonomy
HD984-	B	05		Sipunculoida sp.	ホシムシ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	99.5% EtOH	Taxonomy
HD984-	B	06		Polychaeta sp.1	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	-80	Stable Isotope Analysis
HD984-	B	07		Calyptogena sp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	-80	Stable Isotope Analysis
HD984-	B	08		Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	-80	Stable Isotope Analysis
HD984-	B	09		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	10% Formalin	Taxonomy
HD984-	B	10		Scaphopoda sp.	ツノガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	-80	Stable Isotope Analysis
HD984-	B	11		Bivalvia unidentified	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	99.5% EtOH	Taxonomy

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat de	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD984-	B	12		Polychaeta sp.1	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	99.5% EtOH	Taxonomy
HD984-	B	13	01	Calyptogena sp. small	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	4% paraformal	Nakamura-san
HD984-	B	13	02	Calyptogena sp. small	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	99.5% EtOH	Nakamura-san
HD984-	B	13	03	Calyptogena sp. small	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	4	-80	Nakamura-san
HD984-	B	14		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	10% Formalin	Taxonomy
HD984-	B	15		Gastropoda sp. 1	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	99.5% EtOH	Taxonomy
HD984-	B	16		Buccinidae sp.	エゾバイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	1	10% Formalin	Taxonomy
HD984-	B	17		Bivalvia unidentified	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	5	99.5% EtOH	Taxonomy
HD984-	B	18		Gastropoda sp. 2	腹足類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	99.5% EtOH	Taxonomy
HD984-	B	19		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	10% Formalin	Taxonomy
HD984-	B	20		Bivalvia sp. 2	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	10% Formalin	Taxonomy
HD984-	B	21		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	99.5% EtOH	Taxonomy
HD984-	B	22		Vesicomyidae sp.	オトヒメノハマグリ科?	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	99.5% EtOH	Taxonomy
HD984-	B	23		Bivalvia spp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	99.5% EtOH	Taxonomy
HD984-	B	24		Bivalvia sp. 2	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	99.5% EtOH	Taxonomy
HD984-	B	25		Bivalvia unidentified	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	99.5% EtOH	Taxonomy
HD984-	B	26		Scaphopoda sp.	ツノガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	-80	Stable Isotope Analysis
HD984-	B	27		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	2	-80	Stable Isotope Analysis

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat de	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD984-	B	28		Calyptogena sp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	many	-80	Stable Isotope Analysis
HD984-	S	03		Paralomis multispina	エゾイバラガニ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	2	-80	Stable Isotope Analysis
HD984-	S	04		Unidentified fish	魚類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	S	05		Buccinum sp.	エゾバイ属	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	S	06		Synaphobranchus sp.	ホラアナゴ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	S	07		Nemichthys scolopaceus	シギウナギ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	S	08		Luidiidae sp.	スナヒトデ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	10% Formalin	Taxonomy
HD984-	S	09		Ceramaster sp.	ゴカクヒトデ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	2	-80	Stable Isotope Analysis
HD984-	S	10		Luidiidae sp.	スナヒトデ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	2	-80	Stable Isotope Analysis
HD984-	S	11		Macrouroididae sp.	ハゲダラ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	S	12		Actiniaria sp.	クラゲイソギンチャク	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	-80	Stable Isotope Analysis
HD984-	MBARI	01		Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1178	35	00-92	N	139	13-497	E	2009.4.30	1	99.5% EtOH	Taxonomy
HD984-	MT	01		Calyptogena sp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1170	35	00-069	N	139	13-479	E	2009.4.30	3	-80	Stable Isotope Analysis

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD985-	S	01	01	Calyptogena soyoae	シロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	02	Calyptogena soyoae	シロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	03	Calyptogena soyoae	シロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	04	Calyptogena soyoae	シロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	05	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	06	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	07	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	08	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	09	Calyptogena okutanii	シマイシロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	10	Calyptogena soyoae	シロウリガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	15	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	16	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Takahashi(gill (99.5%EtOH,10%Folmarin)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	17	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Takahashi(gill (99.5%EtOH,10%Folmarin)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	18	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD985-	S	01	19	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	20	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	21	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	22	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	23	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	24	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	25	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	26	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	27	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	28	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol), gonad(Bouin))
HD985-	S	01	29	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	01	30	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Imai(foot(-80), gonad(-80), mantle(-80),shell(Dry)),Seo(mantle(ethanol))
HD985-	S	02	01	Calyptogena gill	シロウリガイ類鰓		Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Takahashi (HPD985-S01-16 Calyptogena's gill)
HD985-	S	02	02	Calyptogena gill	シロウリガイ類鰓		Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	10% Formalin	Takahashi (HPD985-S01-16 Calyptogena's gill)
HD985-	S	02	03	Calyptogena gill	シロウリガイ類鰓		Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Takahashi (HPD985-S01-17 Calyptogena's gill)
HD985-	S	02	04	Calyptogena gill	シロウリガイ類鰓		Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-542	E	2009.5.1	1	10% Formalin	Takahashi (HPD985-S01-17 Calyptogena's gill)
HD985-	S	03		Ophiuroidea sp.	クモヒトデ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	many	99.5% EtOH	Taxonomy
HD985-	S	04		Margarites shinkai	シンカイシタダミ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	many	99.5% EtOH	Taxonomy

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD985-	S	05		Amphipoda sp.	ヨコエビ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	many	99.5% EtOH	Taxonomy
HD985-	S	06		Gastropoda sp. 1	腹足類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	3	99.5% EtOH	Taxonomy
HD985-	S	07		Gastropoda sp. 2	腹足類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Taxonomy
HD985-	S	08		Provanna glaba (dead shell)	サガミハイカブリニナ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	3	99.5% EtOH	Taxonomy
HD985-	S	09	01	Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Stable Isotope Analysis
HD985-	S	09	02	Acharax johnsoni	スエヒロキヌタレガイ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	-80	Yoshida (For CA activity)
HD985-	S	10		Polychaeta spp.	多毛類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	many	99.5% EtOH	Taxonomy
HD985-	S	11		Thyasiridae (shells only)	ハナシガイ科	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Taxonomy
HD985-	S	12		Decapoda sp.	十脚類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Taxonomy
HD985-	S	13		Bivalvia sp.	二枚貝類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	3	99.5% EtOH	Taxonomy
HD985-	S	14		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Taxonomy
HD985-	S	15	01	Pannychia moseleyi Holothroida (without intestines and internal organs)前半部	ハゲナマコ 除 内臓	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	one third	-80	Hori
HD985-	S	15	02	Pannychia moseleyi Holothroida (without intestines and internal organs)中間部	ハゲナマコ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	one third	99.5% EtOH	Hori
HD985-	S	15	03	Pannychia moseleyi Holothroida (without intestines and internal organs)後半部	ハゲナマコ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	one third	-80	Stable Isotope Analysis
HD985-	S	15	04	Pannychia moseleyi Holothroida (intestines and internal organs only)	ハゲナマコ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	only internal organ (1)	-80	Hori
HD985-	S	16		Natsushima bifurcata (found in Acharax johnsoni)	サガミフタカギヤドリ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	1	99.5% EtOH	Taxonomy
HD985-	S	17		Copepoda sp.	カイアシ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	10	99.5% EtOH	Takahashi (by HPD985-S01-17 Calyptogena's gill)
HD985-	S	18		Copepoda sp.	カイアシ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1110	34	58-374	N	139	31-542	E	2009.5.1	10	10% Formalin	Takahashi (by HPD985-S01-17 Calyptogena's gill)

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																			
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD986-	S	01	01	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	05	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	06	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	07	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	08	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	09	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	12	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Takahashi(gill(99.5%EtOH), Seo(mantle(ethanol))
HD986-	S	01	13	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	14	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	15	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	16	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	17	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	18	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																		
Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth(m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD986-	S	01	19	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	20	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	S	01	21	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Seo(mantle(ethanol))
HD986-	B	01	01	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80	Hori (whole body(-80),shell(Dry)) ,Seo(mantle(ethanol))
HD986-	B	01	02	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80,4% paraformaldehyde	Hori ((gill, ovary, other body part (-80), ovary (4% paraformaldehyde),shell(Dry)) ,Seo(mantle(ethanol))
HD986-	B	01	03	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80	Hori (whole body(-80)),shell(Dry) ,Seo(mantle(ethanol))
HD986-	B	01	04	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80	Takahashi ((whole body)-80)),shell(Dry)), Seo(mantle(ethanol))
HD986-	B	01	05	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80	Hori ((whole body)-80)),shell(Dry)), Seo(mantle(ethanol))
HD986-	B	01	06	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80,4% paraformaldehyde	Hori ((gill,testis, other body part (-80), testis (4% paraformaldehyde),shell(Dry)), Seo(mantle(ethanol))
HD986-	B	01	07	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	-80	Hongo ((gill (experiment)), Seo (mantle(ethanol), shell(Dry))
HD986-	B	01	08	Calyptogena spp.	シロウリガイ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	many	-80	Stable Isotope Analysis
HD986-	B	01	09	Calyptogena okutanii / soyoae eggs	シロウリガイ類卵	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2		-80,4% paraformaldehyde	Hori (-80,4% paraformaldehyde)
HD986-	B	02		Thyasiridae spp.	ハナシガイ科	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	Dry	Taxonomy
HD986-	S+B	03		Ophiuroidea sp.	クモヒトデ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	1	10% formalin	Taxonomy
HD986-	S+B	04		Margarites shinkai	シンカイシタダミ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	5	10% formalin	Taxonomy
HD986-	S+B	05		Bivalvia sp.	二枚貝類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	2	10% formalin	Taxonomy
HD986-	S+B	06		Amphipoda sp.	ヨコエビ類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	many	10% formalin	Taxonomy
HD986-	S+B	07		Polychaeta sp.	多毛類	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31-545	E	2009.5.2	many	10% formalin	Taxonomy
HD986-	S	08		Copepoda sp.	サガミシロウリヤドリ	Fujikura	Okinoyama Bank, Seep	Sagami Bay	1103	34	58-374	N	139	31−541	E	2009.5.2	1	99.5%Etoh	シロウリガイの外套腔より
	S+B: slurp gun と boxのサンプルを混ぜたという意味																		

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD987-	B	01		Serradonta sp.	ワタゾコヤドリガサ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	3	-80	
HD987-	B	02		Serradonta sp.	ワタゾコヤドリガサ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	2	99.5% EtOH	Taxonomy
HD987-	B	03		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	3	99.5% EtOH	
HD987-	B	04		Bivalvia spp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	5	99.5% EtOH	Taxonomy
HD987-	B	05		Thyasiridae sp.	ハナシガイ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	5	-80	
HD987-	B	06		Isopoda sp.	等脚類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	2	99.5% EtOH	
HD987-	B	07		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	2	99.5% EtOH	
HD987-	B	08		Amphipoda sp.	ヨコエビ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	many	10% formalin	
HD987-	B	09		Calyptogena spp.	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3	3	飼育用	Nakamura-san
HD987-	B	10		Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	856	35	00-954	N	139	13-318	E	2009.5.3			本郷さん実験用シロウリガイ
HD987-	S	01		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	many	10% formalin	
HD987-	S	02		Ophiuroidea sp.2	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	1	10% formalin	
HD987-	S	03		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	many	99.5% EtOH	
HD987-	S	04		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	1	99.5% EtOH	
HD987-	S	05		Zoarcidae sp.	ゲンゲ科	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	1	-80	
HD987-	S	06		Decapoda sp.	十脚類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	2	-80	Stable Isotope Analysis
HD987-	S	07		Pycnogonida sp.	ウミグモ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	3	-80	

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																			
	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																		
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD987-	S	08		Paralomis multispina	エゾイバラガニ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	1	99.5% EtOH	
HD987-	S	09		Actiniaria sp.	イソギンチャク類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	1	10% formalin	
HD987-	S	10		Bathymodiolus spp.	シンカイヒバリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	many	99.5% EtOH	
HD987-	S	11		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	many	10% formalin	
HD987-	S	12		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	many	10% formalin	
HD987-	S	13		Crustacean spp.	甲殻類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	many	10% formalin	
HD987-	S	14		Bathymodiolus japonicus	シンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	7	飼育用	Yoshida-san
HD987-	S	15		Bathymodiolus platifrons	ヘイトウシンカイヒバリガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	860	35	00-946	N	139	13-325	E	2009.5.3	12	飼育用	Yoshida-san

On board No.はHD-dive #-B00(MT(MT-core), MB)-ind.#																						
	Event(Box, MT-core, MB(MBARI)-core, Slarp-gun)																					
On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Dive/Collecting Methods	Present location	Fixation	Preservation	Remarks
988-101	MBARI-Green			Microorganisms in MBARI-Green core	堆積物中微生物	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	10%Formalin	10%Formalin	MBARI-Green 0-5cm
988-102	MBARI-Green			Microorganisms in MBARI-Green core	堆積物中微生物	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	10%Formalin	10%Formalin	MBARI-Green 5-10cm
988-103	MBARI-Green			Microorganisms in MBARI-Green core	堆積物中微生物	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	10%Formalin	10%Formalin	MBARI-Green 10-13cm
988-104	Whele rib			Palp of Osedax sp.	ホネクイハナムシ類のパルプ	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	-80℃	-80℃	
988-1				Larvae, juveniles polychaetes	多毛類の幼生、幼体	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	10% FA	filtered SW	also 1 nauplius, Plankton canister 1
988-2				Plankton sample	プランクトン	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	10% FA	filtered SW	Plankton canister 1
988-3				Vigtorniella juvenile	幼生	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	10% FA	filtered SW	from 50 microm filtered water from collection box, red sample box
988-4				Isopoda + Cirratulidae + Capitellidae	等脚類,ミズヒキゴカイ科,イトゴカイ科	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	3	HD#988	JAMSTEC	99.5% EtOH		from >500 filtered water from collection box, red sample box
988-5				Plankton sample	プランクトン	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	10% FA	filtered SW	Plankton canister 2
988-6				Polychaetes (hesionidae, polynoidae)	多毛類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	6	HD#988	JAMSTEC	99.5% EtOH		1 hesionidae, 5 polynoidae, Plankton canister 2
988-7				Polychaetes (Capitellidae, cirratulidae, dorvilleidae)	多毛類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	about 35	HD#988	JAMSTEC	99.5% EtOH		about 30 capitellidae, 1 cirratulidae, 2 dorvilleidae from > 500 microm
988-8				50 microm filtration	50ミクロン 濾過物	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	10% FA	filtered SW	Pig bones collection box
988-9				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	freeze -80		Dead specimen, red sample box
988-10				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4	1	HD#988	JAMSTEC	freeze -80		palps + piece of root, red sample box
988-11A				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	freeze -80		root (contaminated), red sample box
988-11B				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	freeze -80		root, red sample box
988-11C				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	2.5% GA	filtered SW	2 pieces of root, red sample box
988-11D				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	10% FA	70% EtOH	body+tube with a few males, red sample box
988-12				50 microm filtration	50ミクロン 濾過物	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	924	35	04.936	N	139	12.980	E	2009.5.4		HD#988	JAMSTEC	10% FA	filtered SW	fitered from bone tank on 06/05/09, red sample box

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On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Dive/Collecting Methods	Present location
989-101	Scoop	101		Foraminifera	有孔虫	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	5	HD#989	JAMSTEC
989-102	Scoop	102		Shells of Thyasiridae	ハナシガイ類の貝殻	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-103	Scoop	103		Amphipoda	ヨコエビの仲間	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-104	Scoop	104		A part of *Paralomis multispina*	エゾイバラガニの体の一部	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-105	Single canister	105		A part of Whale tissue	鯨の体組織の一部	Fujiwara	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5	many	HD#989	JAMSTEC
989-106	Single canister	106		Teeth of Sperm whale(SATOMI)	サトミ鯨の歯	Fujiwara	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5	6	HD#989	JAMSTEC
989-107	Single canister	107		Seaweed	海藻	Fujiwara	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5	many	HD#989	JAMSTEC
989-108	Single canister	108		Cartilaginous tissue of 'SATOMI' whale	サトミ鯨の軟骨の一部	Fujiwara	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5	1	HD#989	JAMSTEC
989-109	Scoop	109		Thyasiridae sp.1 (Thick shell)	ハナシガイ類タイプ1（殻厚い方）	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-110	Scoop	110		Thyasiridae sp.1 (Thick shell)	ハナシガイ類タイプ1（殻厚い方）	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-111	Scoop	111		Thyasiridae sp.1 (Thick shell)	ハナシガイ類タイプ1（殻厚い方）	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-112	Scoop	112		Thyasiridae sp.2 (Thin shell)	ハナシガイ類タイプ2（殻薄い方）	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-113	Scoop	113		Thyasiridae sp.2 (Thin shell)	ハナシガイ類タイプ2（殻薄い方）	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-114	Scoop	114		Thyasiridae sp.2 (Thin shell)	ハナシガイ類タイプ2（殻薄い方）	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-115	Scoop	115		Thyasiridae spp.	ハナシガイ類	Fujiwara	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-116	MBARI-Red	116		Microorganisms in MBARI-red core	堆積物中微生物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-117	MBARI-Red	117		Microorganisms in MBARI-red core	堆積物中微生物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-118	MBARI-Red	118		Microorganisms in MBARI-red core	堆積物中微生物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-119	MBARI-Red	119		Microorganisms in MBARI-red core	堆積物中微生物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-120	MBARI-Red	120		Microorganisms in MBARI-red core	堆積物中微生物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	many	HD#989	JAMSTEC
989-1				Osedax sp.	ホネクイハナムシ類	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC

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989-2				Plankton sample	プランクトンサンプル	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-3				Plankton sample	プランクトンサンプル	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-4				Polynoidae sp.	ウロコムシ類	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-5				Mixed larvae and juveniles	幼生	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-6				Vigtorniella juvenile	幼生	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5	1	HD#989	JAMSTEC
989-7				Plankton sample	プランクトンサンプル	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5		HD#989	JAMSTEC
989-8				Polynoidae sp.	ウロコムシ類	Florence	Off Hatsushima 'SATOMI' whale	Sagami Bay	925	35	04.937	N	139	12.992	E	2009.5.5	6 + 1 juvenile	HD#989	JAMSTEC
989-9				Flabelligeridae sp.	ハボウキゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	5	HD#989	JAMSTEC
989-10				Flabelligeridae sp.	ハボウキゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	6	HD#989	JAMSTEC
989-11				Scalibregmatidae sp.	トノサマゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-12				Scalibregmatidae sp.	トノサマゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	1	HD#989	JAMSTEC
989-13				Cirratulidae	ミズヒキゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	about 10	HD#989	JAMSTEC
989-14				Nereididae	ゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	2	HD#989	JAMSTEC
989-15				Polychaeta (scolecida)	多毛類	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5	2	HD#989	JAMSTEC
989-16				> 1mm filtrate	> 1mm 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-17				> 1mm filtrate	> 1mm 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-18				> 0.5 mm filtrate	> 0.5mm 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-19				> 0.5 mm filtrate	> 0.5mm 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-20				> 0.05 mm filtrate	> 0.05mm 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-21				> 0.05 mm filtrate	> 0.05mm 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC
989-22				Filtrate	濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	929	35	05.002	N	139	13.030	E	2009.5.5		HD#989	JAMSTEC
989-24				Capitellidae	イトゴカイ科	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	929	35	05.002	N	139	13.030	E	2009.5.5		HD#989	JAMSTEC
989-25				50 microm filtration	50ミクロン 濾過物	Florence	Off Hatsushima 'SAGAMI' whale	Sagami Bay	927	35	04.999	N	139	13.024	E	2009.5.5		HD#989	JAMSTEC

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On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD990	B	01	1	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	2	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	3	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	4	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	5	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	6	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	7	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1		
HD990	B	01	8	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	飼育用	Nakamura-san
HD990	B	01	9	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	飼育用	Nakamura-san
HD990	B	01	10	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	99.5%Etoh	
HD990	B	01	11	Calyptogena okutanii / soyoae	シロウリガイ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	-80	
HD990	B	02		Bathyacmaea nipponica	ワタゾコシロアミガサモドキ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	10% formalin	
HD990	B	03		Ophiuroidea sp.	クモヒトデ類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	10% formalin	
HD990	B	04		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	99.5%Etoh	
HD990	B	05		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	10% formalin	Taxonomy
HD990	B	06		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	99.5%Etoh	
HD990	B	07		Bivalvia sp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	-80	Stable Isotope
HD990	B	08		Margarites shinkai	シンカイシタダミ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	10% formalin	
HD990	B	09		Bivalvia spp.	二枚貝類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	2	10% formalin	
HD990	B	10		Conchocele bisecta	オウナガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	-80	Stable Isotope
HD990	B	11		Polynoidae sp.	ウロコムシ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	10% formalin	

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On board No.	Event	sample #	Serial #	Species Name	Japanease Name	Identified by	Locality Site	Locality Area	Depth (m)	Lat deg	Lat min	N/S	Long deg	Long min	E/W	Date	No.of inds.	Fixation	Remarks
HD990	B	12		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	10% formalin	
HD990	B	13		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	99.5%Etoh	
HD990	B	14		Conchocele bisecta	オウナガイ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	飼育用	Yoshida-san
HD990	S	01		Provanna glabra	サガミハイカブリニナ	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	10% formalin	
HD990	S	02		Porifera sp.	カイメン類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	1	99.5%Etoh	
HD990	S	03		Porifera sp.	カイメン類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	many	-80	Stable Isotope
HD990	S	04		Polychaeta spp.	多毛類	Fujikura	Off Hatsuhima Island, seep	Sagami Bay	1171	35	00-072	N	139	13-503	E	2009.5.5	2	10% formalin	

I-2. Water

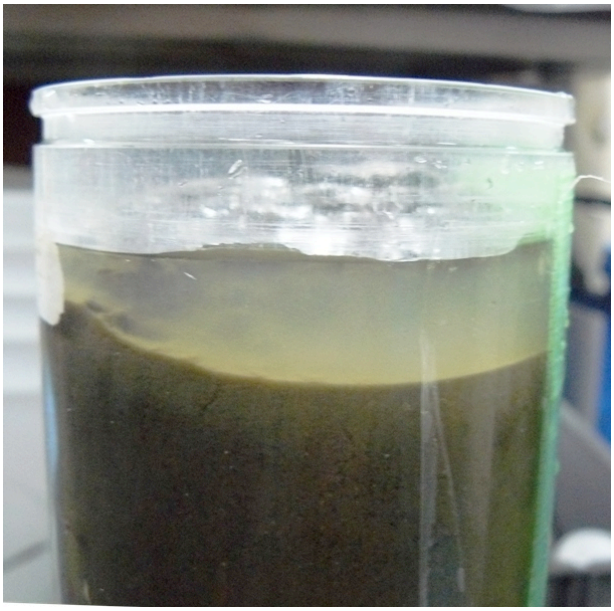
date	time	gear	Dive#	color id	Water#	Volume	description	process	purpose
4月27日	16:15	HPD	977	colorless and transparent	Niskin Bottle	2L	near the Alaysia	filtration by 0.22 μm filter, and re-suspended with sterialised sea water. Stored at -80℃ or 4℃.	Identification of microbial community surrunding alaysia and Calyptogena.

gear	Dive#	date	time	Site	Latitude	Longitude	depth	Core#	color id	length	description	process	investigator	sample	storage	photo	additional description	preliminary result
HPD	973	25.Apr	9:29	off Hatsushima	35-00.970N	139-13.337E	853	MBARI 1	yellow/red	19	clay silt	sliced (0-0.5, 0.5-1, 1-1.5, 1.5-2, 2-3, 3-4, 4-5. , sieving, sorting under binocular	Toyofuku	fixed foraminiferal specimens	glutal fixiation for TEM and culture in bottles		from normal substrate. surface has descent. Clay silt, dark greenish olive green, it become sandy at 4-5cm	
HPD	973	25.Apr	9:24	off Hatsushima	35-00.970N	139-13.337E	853	MBARI 2	red/blue	17	clay silt	sliced (0-0.5, 0.5-1, 1-1.5, 1.5-2, 2-3, 3-4, 4-5. , sieving, sorting under binocular	Fontanier	staind foraminifera and residue of sediment	0.1% rosebengal 20% ethanol seawater fixiation for faunal study. Sediments are stored in the plastic bottles.	x	from nomal substrate. olive green @ mosttop 2cm, dark green 2-5cm, green sediment with gray green patch 5cm-, polychaete tube on the surface, black sand layer @2cm, white small (~2mm) particles aroud 5cm (it was a fractions of shell). Surface very fine.	
HPD	973	25.Apr	9:17	off Hatsushima	35-00.970N	139-13.337E	853	MBARI 3	green/blue	9.5	sandy silt	sliced (0-3, 3-5, 5-8.5), symbiont in ambient environments, RNA based analyses of bacterial community	Hori	frozen sediment	kept at -80°C		from normal substrate. surface has descent. Olive green layer 0-1.5~3.0cm, gray green, olive green patch by black sand particles is contined around 4-5 cm.	
HPD	973	25.Apr	9:39	off Hatsushima	35-00.970N	139-13.337E	853	MT1	black		silty sand	vertical chemical (pH, H2S) profiles	Oguri	H_2S profile			sediment around Calyptogena individual. Strong smell of H2S. Black sediments	
HPD	973	25.Apr	10:02	off Hatsushima	35-00.966N	139-13.335E	854	MT2	green		silt	vertical chemical (pH, H2S) profiles	Oguri	H_2S profile		x	from normal substrate.	
HPD	974	25.Apr	13:45	off Hatsushima	35-00.174N	139-13.479E	1170	MBARI 1	red		sandy silt	(0-2 including orange patch, 2-5 green black sediment. Light green gray clay in the Shell.) RNA based analyses of bacterial community	Hori	frozen sediment	kept at -80°C		Many orange mat patch scattered on the gray-black mat matrix. The core has recovered from orange patch. Sediment seems totally black from CCD cam image.	
HPD	974	25.Apr	13:41	off Hatsushima	35-00.174N	139-13.479E	1170	MBARI 2	black		sandy silt		Fontanier	stained foraminiferal specimens and bulk sediment	0.1% rosebengal 20% ethanol seawater fixiation for faunal study as bluk sediment. Sediments are stored in the glass beaker.		Many orange fibrous patch scattered on the gray-black mat matrix. The core has recovered from orange patch. Some black layers in the dark olive green sediment. core seems totally black from CCD cam image. Unfortunately, samples are lost during sample trasnfer from core to core cutting device.	150 ⁋m size fraction: No living (stained) benthic foraminifera. Only dead specimen of Rutherfordoides rotundata(dominant), Chilostomella ovoidea, Bulimina spp. and Globobulimina spp. 63-150 ⁋m size fraction: No living (stained) benthic foraminifera. No dead benthic foraminifera
HPD	974	25.Apr	13:49	off Hatsushima	35-00.174N	139-13.479E	1170	MT 1	green		silt (soupy)	vertical chemical (pH, H2S) profiles	Oguri	-			Black sediment.	
HPD	974	25.Apr	15:03	off Hatsushima	35-00.099N	139-13.514E	1178	MT 2	black		silt (soupy)	vertical chemical (pH, H2S) profiles	Oguri	-			Black sediment.	
HPD	976	27.Apr	11:49	off Hatsushima	35-00.935N	139-13.222E	803	MT 1	green	10	silt (soupy)	No measurement, No cut. Shell specimen was recovered.	Calyptogena team	a Calyptogena specimen			Near Calyptogena colony. Sediment suface show gray to black. One Calyptogena idividual was included. Soupy. No top water.	
HPD	976	27.Apr	12:00	off Hatsushima	35-00.935N	139-13.222E	803	MT 2	black		silt, sand (soupy)	No measurement, No cut. Shell specimen was recovered.	Calyptogena team	a Calyptogena specimen			Near Calyptogena colony. Sediment suface show gray to black. One Calyptogena idividual was included. Soupy. No top water.	
HPD	976	27.Apr	12:06	off Hatsushima	35-00.935N	139-13.222E	803	MBARI 1	yellow		silt, sand (soupy)	Sediment structure was collapsed before cutting.Bulk sediment is stored in plastic back at 6°C to extract living foraminifera.	Toyofuku	raw sediment			Near Calyptogena colony. Sediment surface indicate gray to black color. No Calyprtogena was included. Sediment was suspeded during core recovery. Only this core had top water in #976 core samples.	

gear	Dive#	date	time	Site	Latitude	Longitude	depth	Core#	color id	length	description	process	investigator	sample	storage	photo	additional description	preliminary result
HPD	976	27.Apr	12:03	off Hatsushima	35-00.935N	139-13.222E	803	MBARI 2	red	10	silty sand	vertical chemical (pH, H2S) profiles are measured. After measument. Cut to several layers (0-0.5cm, 0.5-1.5cm,1.5-3.5cm, 3.5-10cm). Veritcal profiles of pH and H2S were refered to divide the cutting layers.	Oguri, Hori	H_2S, pH profile; frozen sediment	kept at -80°C, 4°C		Near Calyptogena colony. Sediment surface indicate gray to black color. No Calyprtogena was included. Sediment surafce was flat. It is perhaps different from original surface morphology. No top water was recovered. Greenish black. Silty sand from top to bottom. There are some corse sand in the core.	
HPD	977	27.Apr	16:15	off Hatsushima	35-00.944N	139-13.305E	853	MBARI 1	yellow-red	10	silt	sliced to two layers (0-5cm, 5-10cm).	Hori	frozen sediment	kept at -80°C, 4°C		Near Alaysia.The seiment is marble of brownish green, olive green, and black color.Sediment is liquid and contains sands and a small pices of Alaysia.	
HPD	978	28.Apr	10:02	off Hatsushima	35-00.072N	139-13.502E	1171	MBARI 1	red	13	silt (soupy)	vertical chemical (pH, H2S) profiles	Oguri	H_2S, pH profiles			Near Calyptogena colony. Sediment suface was horizontal. 0-2cm olive green, 2-13cm greenish black including olive green patch. show gray to black. One Calyptogena idividual was included. Soupy. No top water.	
HPD	978	28.Apr	10:16	off Hatsushima	35-00.087N	139-13.494E	1170	MBARI 2	yellow									
HPD	978	28.Apr	10:30	off Hatsushima	35-00.188N	139-13.485E	1175	MBARI 3	blue	10	silt	Snails are twiser picked. Sorounding sediments are taken from snails. sliced (0-1, 1-2, 2-3, 3-4, 4-5)	Fontanier		0.1% rosebengal 20% ethanol seawater fixiation for faunal study. Stored in plastic pots.	x	Near long-term observatory station. Generally black. Surface grey-brown . Soft (fluffy). Many snail and shrimps at the SWI. Sediment partialy covered by fibrous translucent vail. 0-3cm olive greenish black. 3-10cm greenish black with light color patches. Sand grains are contiand in fine smooth silt.	
HPD	979	28.Apr	13:58	off Hatsushima	35-00.069N	139-13.536E	1180	MBARI 1	blue/red	19	silty sand	Sediment structure was collapsed before cutting.Bulk sediment is stored in glass beaker at 6°C to extract living foraminifera.	Toyofuku	foraminiferal specimens and bulk sediment		x	Normal sediment. olive green to dark green color in general. Surface is fluffy (of diatoms?). SWI is irregular. At 18cm depth, very coarse sediment (scoriaceous). 7-18cm, many water pockets	
HPD	979	28.Apr	14:00	off Hatsushima	35-00.069N	139-13.536E	1180	MBARI 2	green/blue	13	silty sand	sliced (every 0.5 cm from surface to 3cm, and every 1cm from 3cm to 14cm.	Toyofuku	sediment	stored in 4% formaline seawater	x	Normal sediment. generally olive green with a lower most part made of coarse sediment. SWI almost horizontal	
HPD	979	28.Apr	16:47	off Hatsushima	35-00.092N	139-13.516E	1175	MBARI 3	red	15	sandy silt	vertical chemical (pH, H2S) profiles	Oguri	H2S, pH profiles			Near Calyptogena colony. generally olive green with a lower most part made of coarse sediment. SWI almost horizontal	
HPD	981	29.Apr	13:22	off Hatsushima	35-00.959N	139-13.334E	854	MBARI 1	blue	12	sandy silt	sliced (0-1, 1-2, 2-3, 3-4, 4-5)	Fontanier	sediment	0.1% rosebengal 20% ethanol seawater fixiation for faunal study. Stored in plastic pots.	x	~3m from Calyptogena colony. SWI shows almost horizontal with 2 tubes. Fluffy materials covered on surface. 0-10cm: olive green; 10-12cm:greenish black. A smell of H2S from the bottom of the core.	
HPD	981	29.Apr	13:23	off Hatsushima	35-00.959N	139-13.334E	854	MBARI 2	yellow	18	silt	vertical chemical (pH, H2S) profiles	Oguri	H2S, pH profiles			Near Calyptogena colony. Irregular sediment suface. 0-2cm: Black; 2-18cm: generally olive green with dark patches.	
HPD	981	29.Apr	13:25	off Hatsushima	35-00.959N	139-13.334E	854	MBARI 3	red	10	silt	vertical chemical (pH, H2S) profiles	Oguri	failed			Near Calyptogena colony. SWI is almost flat. Very soft black sediment. Smell of H2S.	
HPD	982	29.Apr	16:44	off Hatsushima	35-00.076N	139-13.481E	1171	MBARI 1	red	10?	silt							
HPD	982	29.Apr	16:51	off Hatsushima	35-00.076N	139-13.481E	1171	MT 1	black	10	silt	vertical chemical (pH, H2S) profiles	Oguri	failed			Near Calyptogena colony. Irregular sediment suface. 0-2cm: Black; 2-18cm: generally olive green with dark patches.	

gear	Dive#	date	time	Site	Latitude	Longitude	depth	Core#	color id	length	description	process	investigator	sample	storage	photo	additional description	preliminary result
HPD	982	29.Apr	17:55	off Hatsushima	35-00.188N	139-13.463E	1176	MBARI 2	green/blue	10	silt	vertical chemical (pH, H2S) profiles	Oguri	failed			Near Calyptogena colony. Irregular sediment suface. 0-2cm: Black; 2-18cm: generally olive green with dark patches.	
HPD	984	30.Apr	15:47	off Hatsushima	35-00.069N	139-13.479E	1170	MBARI 1	red	17	fine silt	vertical chemical (pH, H2S) profiles	Oguri	H2S, pH profiles		x	Near Calyptogena colony. Irregular sediment suface. 0-3cm: olive green; 3-17cm: dark color (black)	
HPD	984	30.Apr	15:49	off Hatsushima	35-00.069N	139-13.479E	1170	MBARI 2	blue/red	16	silty sand	vertical chemical (pH, H2S) profiles	Oguri	H2S, pH profiles		x	Near Calyptogena colony. SWI is oblique (2cm of shift). 0-4.5cm: olive-green color -silty sand- 4.5-16cm Black silk, 2 small tubes	
HPD	984	30.Apr	17:07	off Hatsushima	35-00.145N	139-13.509E	1184	MBARI 3	green/blue	25	silt	sliced (every 0.5 cm from surface to 3cm, and every 1cm from 3cm to 15cm.	Toyofuku	sediment	stored in 4% formaline seawater	x	Near Lander. SWI slightly oblique and very fluffy (0-1 cm very fluid)	
HPD	985	1.May	12:13	Okinoyama-tai bank	34-58.374N	139-31.542E	1103	MBARI 1	yellow	-	sand	Sediment structure was collapsed during ROV recovery.	Toyofuku	living foraminifera	measurements are done		Near Calyptogena colony.	
HPD	985	1.May	12:56	Okinoyama-tai bank	34-58.372N	139-31.574E	1090	MBARI 2	blue	25	granule	No measurement.	-	-	-		0.5cm-bottm: Granule.	
HPD	986	2.May	16:36	Okinoyama-tai bank	34-58.374N	139-31.545E	1103	MBARI 1	green/blue	-	-	-	-	-			Near Calyptogena colony.	
HPD	986	2.May	16:47	Okinoyama-tai bank	34-58.372N	139-31.545E	1097	MBARI 2	red	6	silt-coarse sand	Sediment structure was collapsed.	Fontanier, Toyofuku	living foraminifera	stored for chemical measurement		Normal sediment. Olive green.	
HPD	986	2.May	17:01	Okinoyama-tai bank	34-58.372N	139-31.558E	1095	MBARI 3	blue/red	1	silt-coarse sand	too short	-	-			Normal sediment. Olive green.	

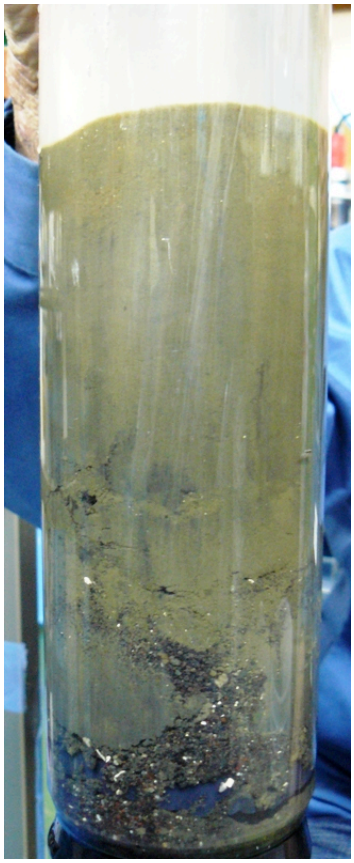
Dive #973 MBARI 2 (Red/Blue)



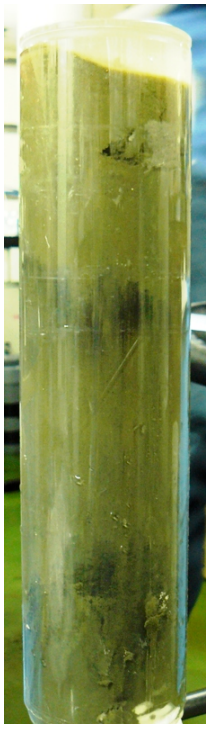
Dive #973 MT2 (Green)

Dive #978 MBARI 3 (Blue)

Dive #979 MBARI 1 (Blue/Red)



Dive #979 MBARI 2 (Gree/Blue) Dive #981 MBARI 1 (Blue)

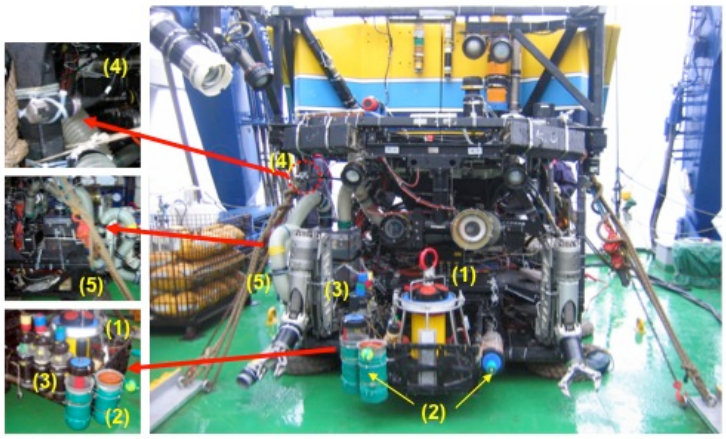


Dive #984 MBARI 2 (Blue/Red) Dive #984 MBARI 3 (Green/Blue)

Dive #984 MBARI 1 (Red)

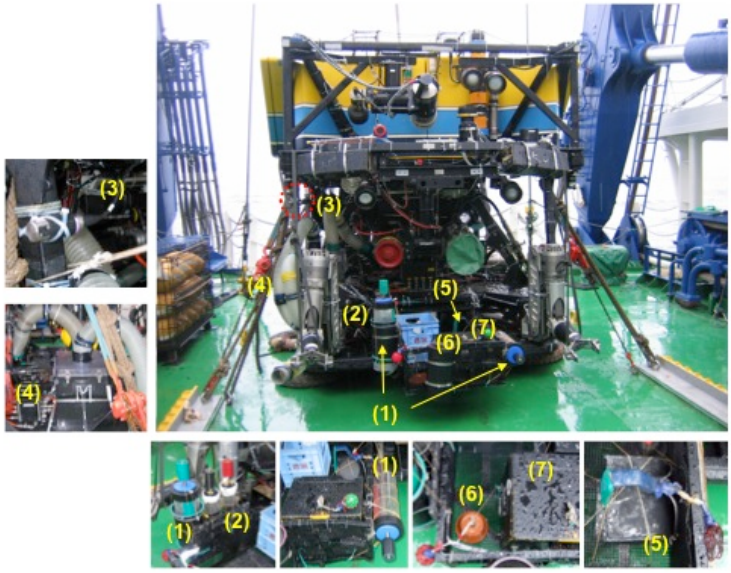
II. Payload list & photo

Dive 973 (NT09-06) **2009 April 25th a.m.**



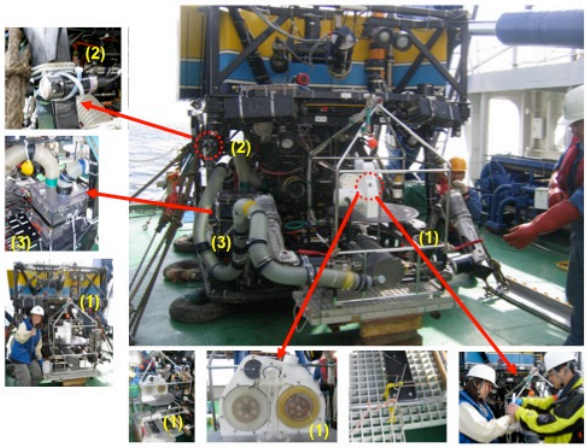
April 25th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #973**	(1) ADCP(Acoustic Doppler Current Profiler)	1
	(2) MT-type core sampler	2
	(3) MBARI-type core sampler	3
	(4) Optode(Oguri's DO detector)	1
	(5) Suction sampler system (Slurp Gun)	1

Dive 974 (NT09-06) **2009 April 25th a.m.**



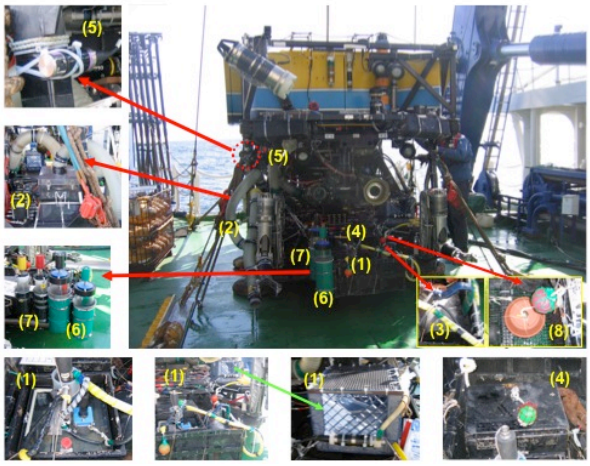
April 25th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #974**	(1) MT-type core sampler	2
	(2) MBARI-type core sampler	3
	(3) Optode(Oguri's DO detector)	1
	(4) Suction sampler system (Slurp Gun)	1
	(5) Scoop sampler	1
	(6) Flower pot- type Markers	1
	(7) Sample Box	1

Dive 975 (NT09-06) 2009 April 26th a.m.



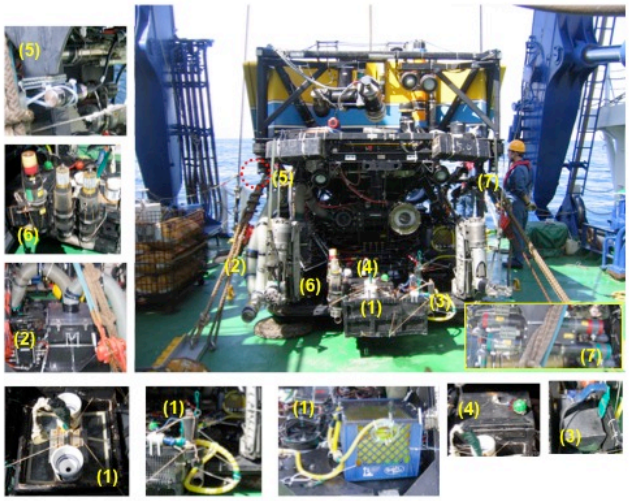
April 26th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #975**	(1) In situ plankton sampler	1
	(2) Optode(Oguri's DO detector)	1
	(3) Suction sampler system (Slurp Gun)	1

Dive 976 (NT09-06) 2009 April 27th a.m.



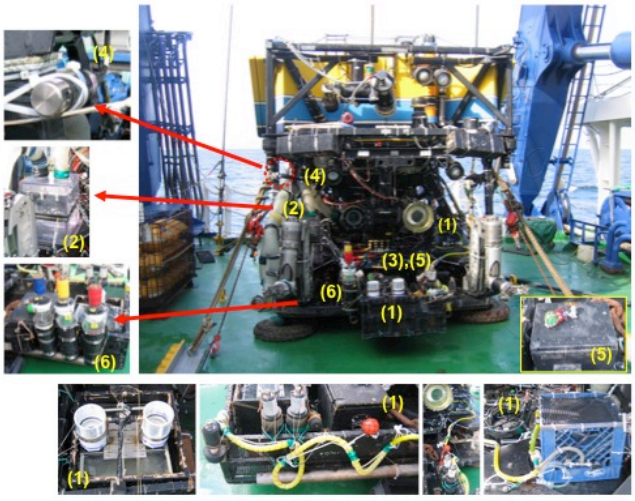
April 27th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #976**	(1) In situ gamete sampler	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Sample box (small size syntactic box)	1
	(5) Optode(Oguri's DO detector)	1
	(6) MT-type core sampler (two hole)	2
	(7) MBARI-type core sampler	2
	(8) Flower pot- type Markers	1

Dive 977 (NT09-06) 2009 April 27th p.m.



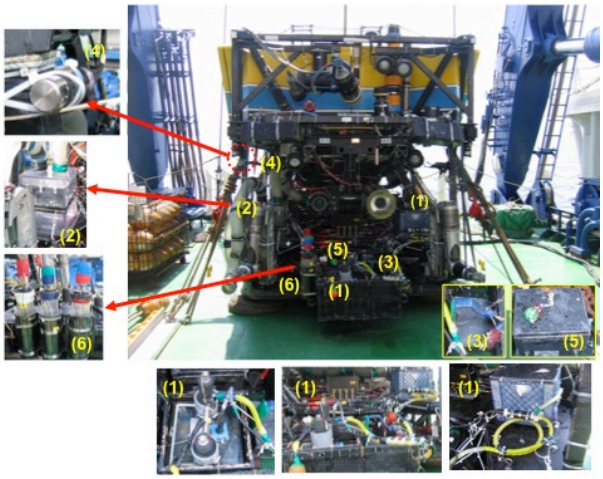
April 27th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #977**	(1) In situ box for growth rate estimation	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Sample box (big size syntactic box)	1
	(5) Optode(Oguri's DO detector)	1
	(6) MBARI-type core sampler	3
	(7) Niskin Bottle	2

Dive 978 (NT09-06) 2009 April 28th a.m.



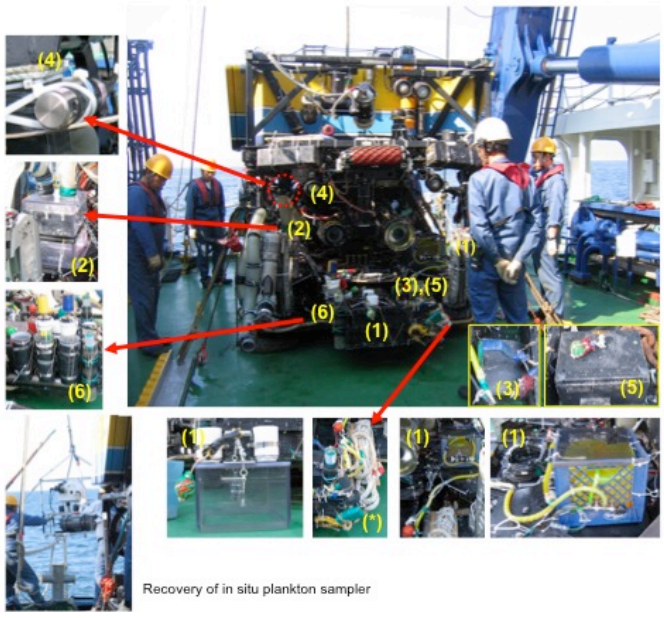
April 28th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #978**	(1) In situ dying system	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3

Dive 979 (NT09-06) 2009 April 28th p.m.



April 28th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #979**	(1) In situ gamete sampler	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3

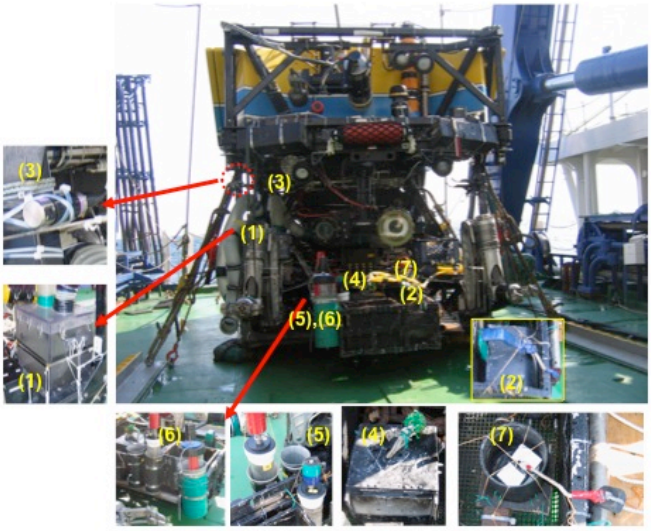
Dive 981 (NT09-06) 2009 April 29th a.m.



Recovery of in situ plankton sampler

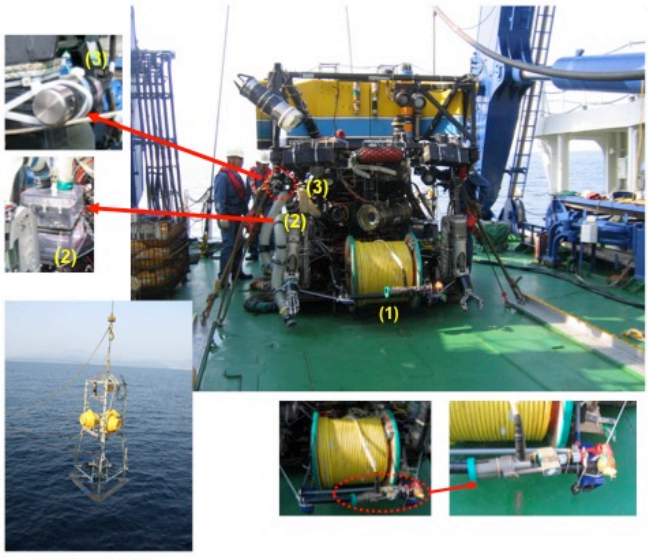
April 29th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #981**	(1) In situ box for growth rate estimation	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3
	* Recovery system of plankton sampler	1

Dive 982 (NT09-06) 2009 April 29th p.m.



April 29th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #982**	(1) Suction sampler system (Slurp Gun)	1
	(2) Scoop sampler	1
	(3) Optode(Oguri's DO detector)	1
	(4) Sample box (small size syntactic box)	1
	(5) MBARI-type core sampler	2
	(6) MT-type core sampler	1
	(7) Thermometer (small size)	2

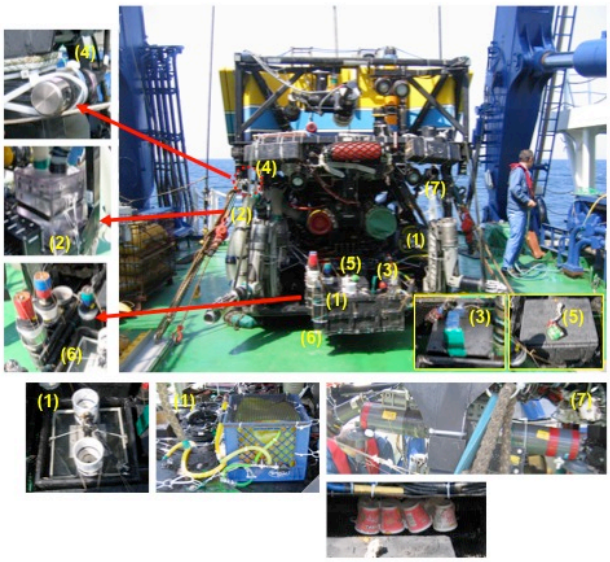
Dive 983 (NT09-06) 2009 April 30th a.m.



Lander system

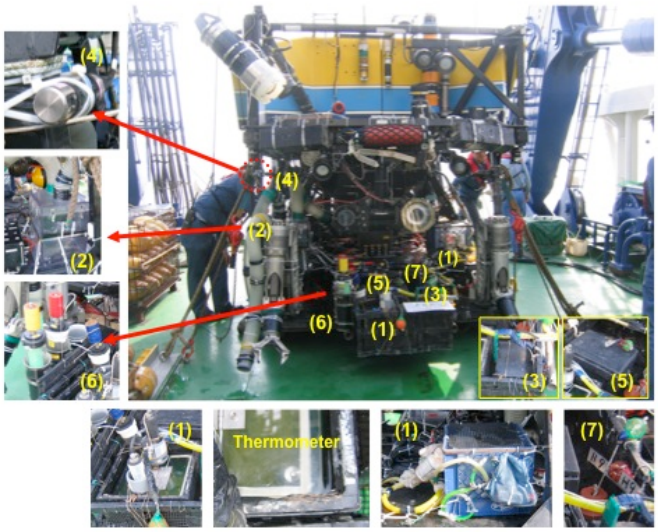
April 30th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #983**	(1) Lander system	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Optode(Oguri's DO detector)	1

Dive 984 (NT09-06) 2009 April 30th p.m.



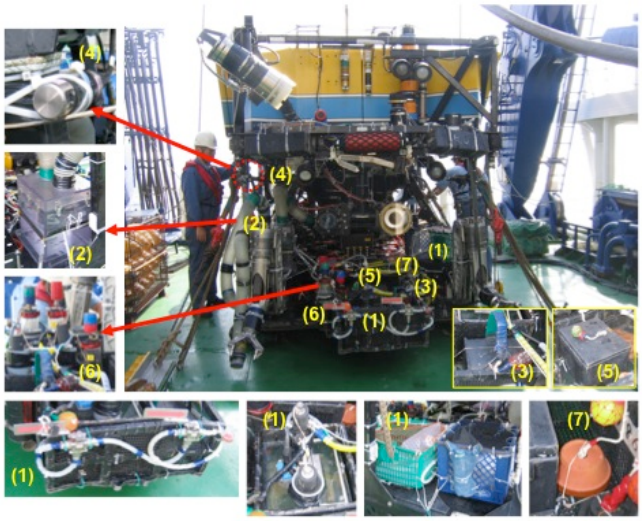
April 30th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #984**	(1) In situ box for growth rate estimation	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3
	(7) Niskin Bottle	1

Dive 985 (NT09-06) 2009 May 1st



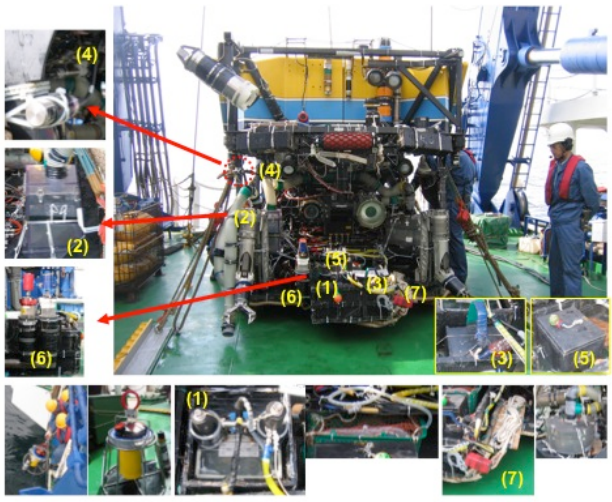
May 1st 2009	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #985**	(1) In situ gamete sampler	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3
	(7) Flower pot- type Markers	1

Dive 986 (NT09-06) 2009 May 2nd



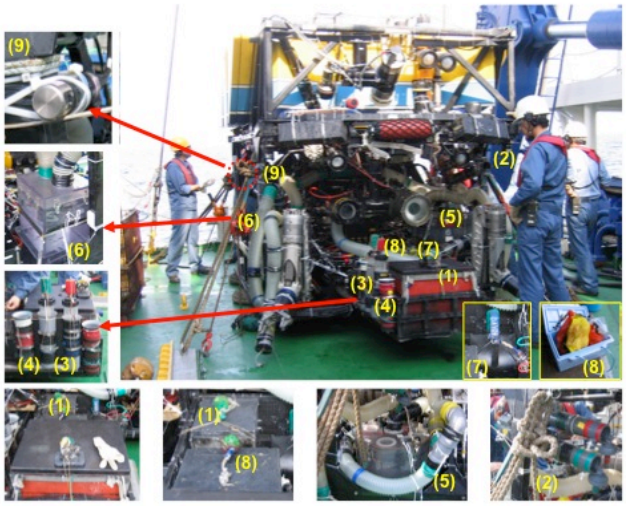
May 2nd 2009	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #986**	(1) In situ gamete sampler	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3
	(7) Flower pot- type Markers	1

Dive 987 (NT09-06) 2009 May 4th a.m.



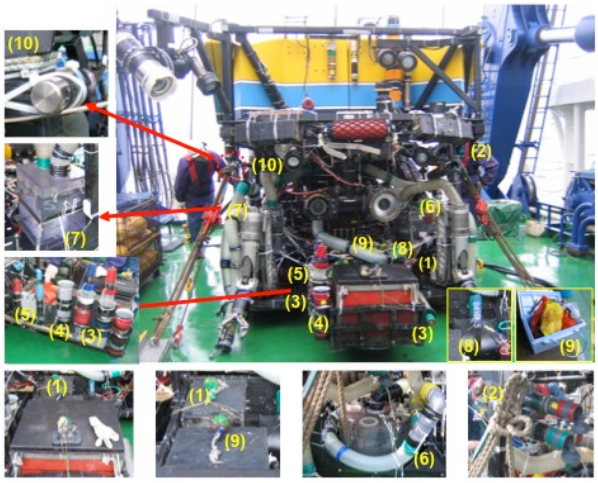
May 4th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #987**	(1) In situ gamete sampler	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	2
	(7) Recovery system for ADCP	1

Dive 988 (NT09-06) 2009 May 4th p.m.



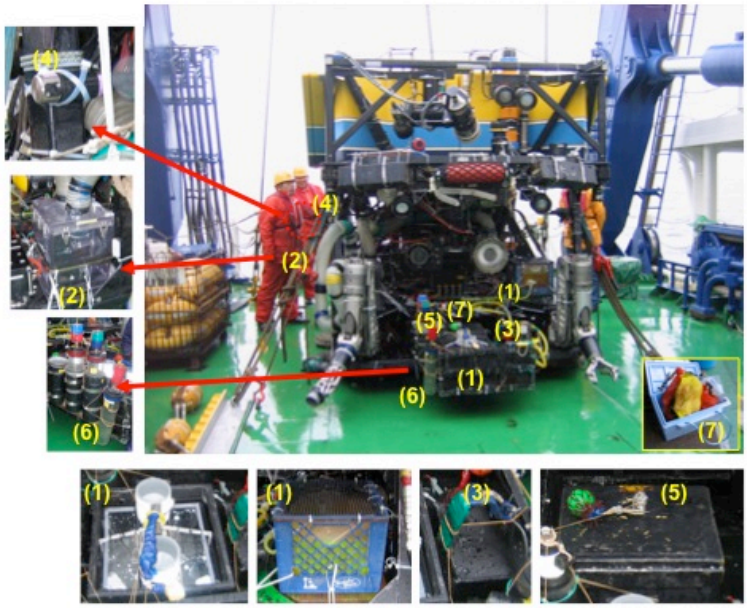
May 4th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #988**	(1) Sample box (small x 2, large x 1)	3
	(2) Niskin bottle	2
	(3) MBARI-type core sampler	3
	(4) blank MBARI-type core sampler	1
	(5) Suction sampler system with multi canister	1
	(6) Suction sampler system (Slurp Gun)	1
	(7) Scoop sampler	1
	(8) pig bone	1
	(9) Optode(Oguri's DO detector)	1

Dive 989 (NT09-06) 2009 May 5th a.m.



May 5th 2009 (a.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #989**	(1) Sample box (small x 2, large x 1)	3
	(2) Niskin bottle	2
	(3) MBARI-type core sampler	3
	(4) blank MBARI-type core sampler	1
	(5) Sterile core smpler	2
	(6) Suction sampler system with multi canister	1
	(7) Suction sampler system (Slurp Gun)	1
	(8) Scoop sampler	1
	(9) pig bone	1
	(10) Optode(Oguri's DO detector)	1

Dive 990 (NT09-06) 2009 May 5th p.m.



May 5th 2009 (p.m.)	Payload List	verification of quantity
ROV Hyper Dolphin **Dive #990**	(1) In situ box for growth rate estimation	1
	(2) Suction sampler system (Slurp Gun)	1
	(3) Scoop sampler	1
	(4) Optode(Oguri's DO detector)	1
	(5) Sample box (small size syntactic box)	1
	(6) MBARI-type core sampler	3
	(7) pig bones	1

III. List of Video and Still Camera

NT09-06_Leg1 Dive Video List													
							JAMSTEC					Univ. of Ryukyus	
Date	Site Name	Dive No.	Camera	Time (UTC+9h)			Fujikura	Fujiwara	Miyazaki	Oguri	Fontanier	Imai	Remarks
2009.4.25	Off Hatsushima	HPD#973	HDTV	10:55	–	10:13	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		CCD	10:55	–	10:13	DVD	---	---	---	---	---	
		HPD#974	HDTV	13:30	–	15:30	DVD	---	---	DVD	DVD	DVD	
			HDTV	15:30	–	16:07	DVD	---	---	DVD	DVD	DVD	
			CCD	13:30	–	15:30	DVD	---	---	---	---	---	
			CCD	15:30	–	16:07	DVD	---	---	---	---	---	
2009.4.26	Off Hatsushima	HPD#975	HDTV	8:55	–	10:55	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		HDTV	10:55	–	11:07	DVD	---	---	DVD	DVD	DVD	
			CCD	8:55	–	10:55	DVD	---	---	---	---	---	
			CCD	10:55	–	11:07	DVD	---	---	---	---	---	
2009.4.27	Off Hatsushima	HPD#976	HDTV	8:51	–	10:51	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		HDTV	10:51	–	12:19	DVD	---	---	DVD	DVD	DVD	
			CCD	8:51	–	10:51	DVD	---	---	---	---	---	
			CCD	10:51	–	12:19	DVD	---	---	---	---	---	
		HPD#977	HDTV	14:46	–	16:46	DVD	---	---	DVD	DVD	DVD	
			HDTV	16:46	–	16:56	DVD	---	---	DVD	DVD	DVD	
			CCD	14:46	–	16:46	DVD	---	---	---	---	---	
			CCD	16:46	–	16:56	DVD	---	---	---	---	---	
2009.4.28	Off Hatsushima	HPD#978	HDTV	9:01	–	10:45	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		CCD	9:01	–	10:45	DVD	---	---	---	---	---	
		HPD#979	HDTV	13:54	–	15:54	DVD	---	---	DVD	DVD	DVD	
			HDTV	15:54	–	16:56	DVD	---	---	DVD	DVD	DVD	
			CCD	13:54	–	15:54	DVD	---	---	---	---	---	
			CCD	15:54	–	16:56	DVD	---	---	---	---	---	
2009.4.29	Off Hatsushima	HPD#980	HDTV		–		---	---	---	---	---	---	着底せずに浮上
	Cold seep site		CCD		–		---	---	---	---	---	---	
	Off Hatsushima	HPD#981	HDTV	11:34	–	13:34	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		HDTV	13:34	–	13:39	DVD	---	---	DVD	DVD	DVD	
			CCD	11:34	–	13:34	DVD	---	---	---	---	---	
			CCD	13:34	–	13:39	DVD	---	---	---	---	---	
	Off Hatsushima	HPD#982	HDTV	16:26	–	17:58	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		CCD	16:26	–	17:58	DVD	---	---	---	---	---	
2009.4.30	Off Hatsushima	HPD#983	HDTV	9:00	–	11:00	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		HDTV	11:00	–	12:23	DVD	---	---	DVD	DVD	DVD	
			CCD	9:00	–	11:00	DVD	---	---	---	---	---	
			CCD	11:00	–	12:23	DVD	---	---	---	---	---	
	Off Hatsushima	HPD#984	HDTV	14:53	–	16:53	DVD	---	---	DVD	DVD	DVD	
	Cold seep site		HDTV	16:53	–	17:13	DVD	---	---	DVD	DVD	DVD	
			CCD	14:53	–	16:53	DVD	---	---	---	---	---	
			CCD	16:53	–	17:13	DVD	---	---	---	---	---	
2009.5.1	Okinoyama Bank	HPD#985	HDTV	9:07	–	11:07	DVD	---	---	DVD	DVD	DVD	
			HDTV	11:07	–	13:07	DVD	---	---	DVD	DVD	DVD	
			HDTV	13:07	–	15:07	DVD	---	---	DVD	DVD	DVD	
			HDTV	15:07	–	16:36	DVD	---	---	DVD	DVD	DVD	
			CCD	9:07	–	11:07	DVD	---	---	---	---	---	
			CCD	11:07	–	13:07	DVD	---	---	---	---	---	
			CCD	13:07	–	15:07	DVD	---	---	---	---	---	
			CCD	15:07	–	16:36	DVD	---	---	---	---	---	
2009.5.2	Okinoyama Bank	HPD#986	HDTV	9:08	–	11:08	DVD	---	---	DVD	DVD	DVD	
			HDTV	11:08	–	13:08	DVD	---	---	DVD	DVD	DVD	
			HDTV	13:08	–	15:08	DVD	---	---	DVD	DVD	DVD	
			HDTV	15:08	–	17:08	DVD	---	---	DVD	DVD	DVD	
			CCD	9:08	–	11:08	DVD	---	---	---	---	---	
			CCD	11:08	–	13:08	DVD	---	---	---	---	---	
			CCD	13:08	–	15:08	DVD	---	---	---	---	---	
			CCD	15:08	–	17:08	DVD	---	---	---	---	---	
2009.5.4	Off Hatsushima	HPD#987	HDTV	8:58	–	10:58	DVD	---	---	DVD	DVD	---	
	Cold seep site		HDTV	10:58	–	12:58	DVD	---	---	DVD	DVD	---	
			HDTV	12:58	–	13:08	DVD	---	---	DVD	DVD	---	
			CCD	8:58	–	10:58	DVD	---	---	---	---	---	
			CCD	10:58	–	12:58	DVD	---	---	---	---	---	
			CCD	12:58	–	13:08	DVD	---	---	---	---	---	
2009.5.4	Off Hatsushima	HPD#988	HDTV	16:05	–	18:05	DVD	DVD	DVD	DVD	DVD	---	
	Whale bone site		HDTV	18:05	–	19:01	DVD	DVD	DVD	DVD	DVD	---	
			CCD	16:05	–	18:05	DVD	DVD	DVD	---	---	---	
			CCD	18:05	–	19:01	DVD	DVD	DVD	---	---	---	
2009.5.5	Off Hatsushima	HPD#989	HDTV	8:51	–	10:51	DVD	DVD	DVD	DVD	DVD	---	
	Whale bone site		HDTV	10:51	–	12:19	DVD	DVD	DVD	DVD	DVD	---	
			CCD	8:51	–	10:51	DVD	DVD	DVD	---	---	---	
			CCD	10:51	–	12:19	DVD	DVD	DVD	---	---	---	
2009.5.5	Off Hatsushima	HPD#990	HDTV	17:20	–	19:11	DVD	---	---	DVD	DVD	---	
	Cold seep site		CCD	17:20	–	19:11	DVD	---	---	---	---	---	

IV. Shipboard log (Nakamura & Aoki)

NT09-06 Shipboard Log (Nakamura, Y.)				
Date	Dive No.	Time	Comment 1	
			HPD activity	Researcher's activity
24, April, 09				
		14:00		Boading
		14:00		Science meeting
		15:00		Dparture at JANSTEC
		15:20		Science meeting
		15:30		The lecture on boad for the newcomer
		16:40		Konpira San
		17:30		The ture on boad for the newcomer
		18:00		Science meeting
25, April, 09	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 973	8:10	landing on sea water	
		8:19	going into under sea water	
		8:55	landing on the bottom	
		10:10	leaving for the surface	
		10:35	surfacing	
	# 974	12:40	landing on sea water	
		13:30	landing on the bottom	
		16:03	leaving for the surface	
		16:35	sufacing	
		19:30		Science meeting
26, April, 09	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 975	8:10	landing on sea water	
		8:20	going into under sea water	
		9:01	landing on the bottom	
		11:05	leaving for the surface	
		11:28	surfacing	
	# 976		delayed diving of HPD until next day by bad weather	
		18:00		Science meeting
27, April, 09	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 976	8:10	landing on sea water	
		8:20	going into under sea water	
		8:52	landing on the bottom	
		12:11	leaving for the surface	
		12:36	surfacing	
	# 977	14:07	landing on sea water	
		14:17	going into under sea water	
		14:46	landing on the bottom	
		16:54	leaving for the surface	
		17:19	surfacing	
		19:30		Science meeting
28, April, 09	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 978	8:11	landing on sea water	
		8:22	going into under sea water	
		9:02	landing on the bottom	
		10:42	leaving for the surface	
		11:14	surfacing	
	# 979	13:06	landing on sea water	
(Depth m)		13:16	going into under sea water	
		13:54	landing on the bottom	
		16:55	leaving for the surface	
		17:27	surfacing	
		19:30		Science meeting

NT09-06 Shipboard Log (Nakamura, Y.)				
Date	Dive No.	Time	Comment 1	
			HPD activity	Researcher's activity
29, April, 09	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 980	8:14	landing on sea water	
(Depth 78		8:24	going into under sea water	
			Emergency surfacing. HPD was in trouble with the low level of oil.	
		9:19	surfacing	
			Recovered from the oil trouble	
	# 981	10:55	landing on sea water	
(Depth 858 m)		11:05	going into under sea water	
		11:34	landing on the bottom	
		13:34	leaving for the surface	
		13:59	surfacing	
	# 982	15:37	landing on sea water	
(Depth 1179 m)		15:46	going into under sea water	
		16:27	landing on the bottom	
		17:57	leaving for the surface	
		18:30	surfacing	
		19:30		Science meeting
30, April, 09	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 983	8:04	landing on sea water	
(Depth 1213 m)		8:17	going into under sea water	
		9:00	landing on the bottom	
		12:18	leaving for the surface	
		12:50	surfacing	
	# 984	14:05	landing on sea water	
(Depth 1186 m)		14:16	going into under sea water	
		14:54	landing on the bottom	
		17:09	leaving for the surface	
		17:42	surfacing	
		19:30		Science meeting
1, May, 09	Okinoyama Bank Site of Sheep Community, Sagami Bay			
	# 985	8:10	landing on sea water	
(Depth 1164 m)		8:21	going into under sea water	
		9:07	landing on the bottom	
		16:29	leaving for the surface	
		16:59	surfacing	
		19:30		Science meeting
2, May, 09	Okinoyama Bank Site of Sheep Community, Sagami Bay			
	# 986	8:15	landing on sea water	
(Depth 1118 m)		8:25	going into under sea water	
		9:06	landing on the bottom	
		17:04	leaving for the surface	
		17:36	surfacing	
		19:30		Science meeting
		21:00		Drinking party after the successful of
				missions and for the members who will
				be leaving at May third
3, May, 09	Sagami Bay to Misaki port			
the day for the maintenance of HPD and the shift of the members				
		13:00		Science meeting about future works
		14:00		Lab cleaning
		16:00		Group photos
		17:00	Because of bad weather, the shif of members were cancelled.	

NT09-06 Shipboard Log (Nakamura, Y.)				
Date	Dive No.	Time	Comment 1	
			HPD activity	Researcher's activity
4, May, 09	Misaki port to Sagami Bay			
		5:30		The shift of the members
		6:00		Science meeting for new members
	Off Hatsushima Island, Sagami Bay Sheep Community			
	# 987	8:10	landing on sea water	
(Depth 860 m)		8:20	going into under sea water	
		8:59	landing on the bottom	
		13:03	leaving for the surface	
		13:30	surfacing	
	NE Off Hatsushima Island, whale fall site, Sagami Bay			
	# 988	15:26	landing on sea water	
(Depth 929 m)		15:35	going into under sea water	
		16:06	landing on the bottom	
		18:59	leaving for the surface	
		19:26	surfacing	
		20:30		Science meeting
5, May, 09	NE Off Hatsushima Island, whale fall site, Sagami Bay			
	# 989	8:07	landing on sea water	
		8:16	going into under sea water	
		8:52	landing on the bottom	
		10:45		Sampling of surface layer seewater Latitude 35°05.007 N Longitude 139°13.071 E
		12:15	leaving for the surface	
		12:42	surfacing	
	Off Hatsushima Island, Sagami Bay Sheep Community			
		13:30	HPD was in trouble with the communication across the wire.	Meeting about the trouble
		16:00	Recovered from the trouble	
	# 990	16:27	landing on sea water	
		16:36	going into under sea water	
		17:20	landing on the bottom	
		19:08	leaving for the surface	
		19:42	surfacing	
6, May, 09	Sagami Bay to JAMSTEC			
		8:00	NATSUSHIMA was docked at the port of JAMSTEC.	