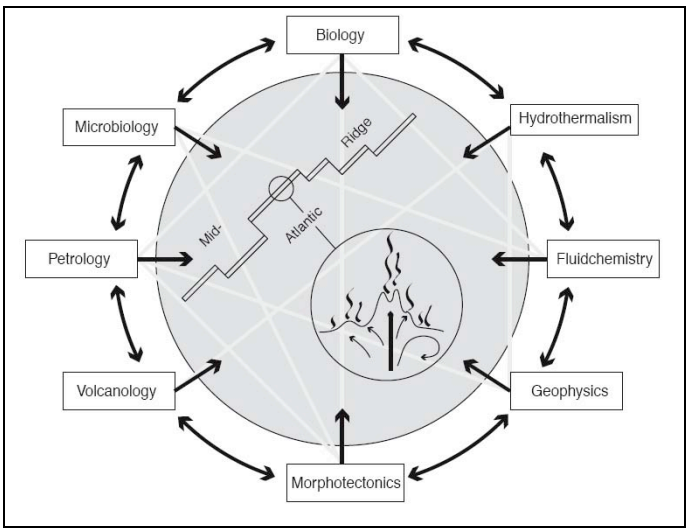


SPP-reader

The bi-annual newsletter of the DFG Priority Program SPP 1144
Issue 8, January 2009

The SPP 1144 web site is at:
www.deridge.de

Eighth Edition

The SPP 1144: “From Mantle to Ocean: Energy-, Material- and Life-Cycles at Spreading Axes” started on the first of October 2003, and with it this newsletter. In general, there will be two editions per year. We hope that you will find this newsletter useful. Please send any feedback you may have to Sabine Lange (slange@ifm-geomar.de). This is also the address to use if you have a contribution which you would like to be included in the next issue.
Our bi-annual newsletter aims to bring you all the latest developments and news related to the SPP and other international activities at mid-ocean ridges.

In this issue

Summary HYDROMAR V (RV l'Atalante)

The overall goal of this leg was the investigation of causes for temporal and spatial compositional differences of hydrothermal fluids and their effect on the vent communities in the Logatchev hydrothermal field. The cruise HYDROMAR V started in Toulon where the ROV and the winch were adapted onto the l'Atalante during four days. Two days were included for harbour and sea trials prior to leaving for the working area. The original scientific program was scheduled for 18 working days. The problems with the research vessel MARIA S. MERIAN resulted in a shortening of the working time for the four research cruises that were rescheduled onto the French research vessel l'Atalante. HYDROMAR V therefore was allocated only 12 working days. In addition, due to a heart attack of a french crew member at Christmas Eve the scientific program had to be stopped early after only 9 working days affecting considerably the scientific program. Taking the unexpected short time of 9 days of station work cruise HYDROMAR V with RV "l'Atalante" and ROV "Kiel 6000" was still successful. We had no downtime of the ROV due to repairs or weather conditions and were able to achieve 8 dives during 8 consecutive days. Weather conditions (up to seastate 6-7) precluded recovery of the instrument at night for the first couple of days limiting the time available at the seafloor for those first days. Problems with the Posidonia subpositioning system on board the l'Atalante prevented accurate positioning during most dives. However, localization of the dive targets was possible because of our precise knowledge of the hydrothermal field based on the subpositioning during cruise MSM04/3 in January 2007 using the ROV Jason 2.

Due to the overall time limitations of the cruise several geophysical monitoring instruments, previously deployed during MSM04/3 could not be recovered. Also instruments and an additional mooring that should have been installed during this cruise could not be deployed. A major drawback to the scientific program was our inability to deploy the 720 m profiling mooring (scheduled to be the last scientific station of the cruise) because of the emergency transit to French-Guayana.

At specific sites around the hydrothermal field we deployed 4 ocean bottom seismometers to monitor local seismicity. These seismoneters will be collected on a later cruise of SPP 1144. Additionally, an ocean bottom tiltmeter (OBT) and an ocean bottom accelerometer (OBA) were deployed at Logatchev itself and will allow the correlation of regional and local seismicity to seafloor movements at the black smoker vents. Two high-temperature monitoring recorders are now deployed at two different vent sites and will monitor temperature changes at two different sampling rates (1s for 1 month and 15s for a longer period). It will now be possible to relate changes in hydrothermal activity and vent exit temperature to tectonic processes. The hydrothermal plume as well as low- and high-temperature hydrothermal fluids was sampled successfully, as were the vertical temperature gradients in low-temperature diffuse discharge areas associated with biological communities. Selected samples of seawater, the hydrothermal plume and sediments were taken for metagenomic studies.

Temperature measurements at individual black smoker vent sites show a pronounced increase in vent fluid temperatures at some sites (350°C to >370°C) when compared to earlier years and even to the last SPP 1144 cruise

that took place in January 2007. We have to wait for the on-shore geochemical analyses of the vent fluids in order to see if there are major chemical changes of the vent fluids associated with this temperature increase. On-board analyses of the Cl-concentration (Cl_{min}=540mM Cl) reveal no changes to previous measurements indicating that no significant change in the chlorinity has taken place. Another major focus was the sampling of the vent biota, which, due to the limited time on site, recovered less material than originally anticipated. Preliminary data suggest that two different mussel populations are present at the two major working sites IRINA 2 and QUEST. The gills, foot and gonads of most of the specimens collected vary distinctly between the two sites.

ROV KIEL 6000 onboard R/V l'Atalante

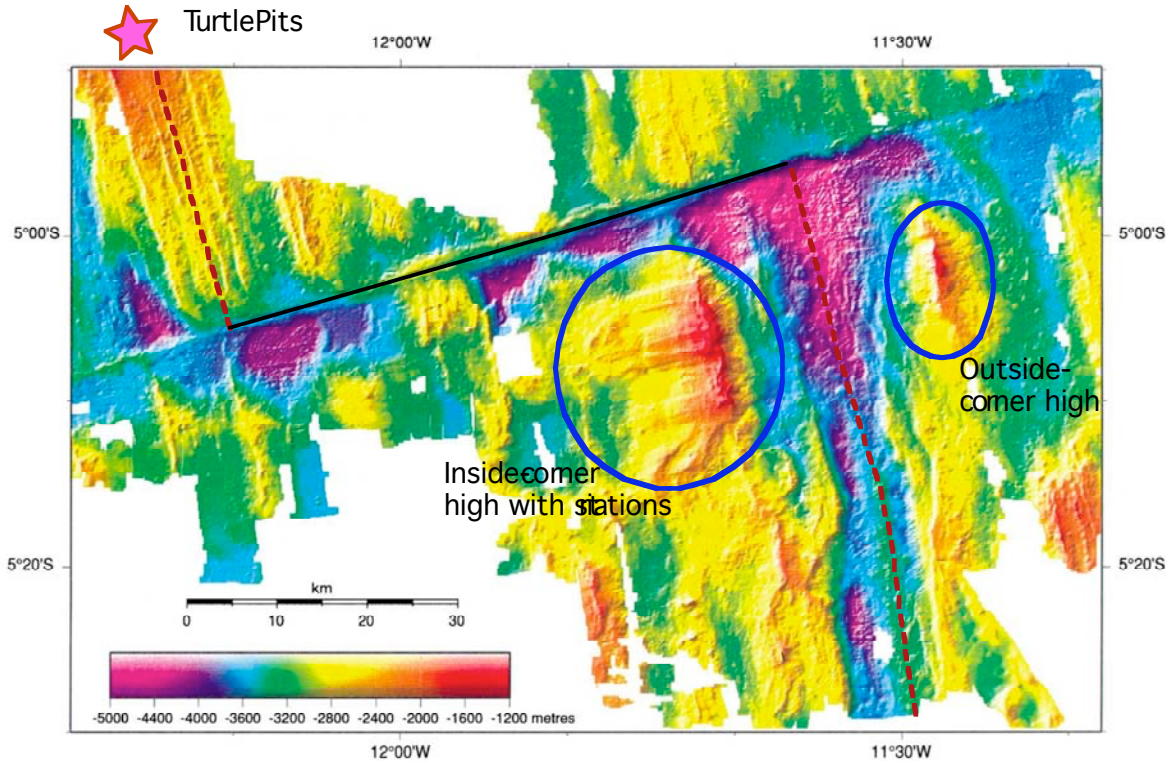
Plume surveys, totalling 15 CTD-casts and 2 TOW-YO's, were repeatedly performed at the same sites to investigate plume behavior over time and with changing tides. During this cruise we also deployed an ADCP on a tripod in the immediate vicinity of a black smoker at IRINA II, measuring local bottom currents and recording plume behavior for 7 days. Preliminary analyses of this unique data set show the strong tidal variations of the bottom currents affecting plume dispersal.

At Christmas the Atalante started her transit towards Cayenne in French Guayana, to disembark the French crew member and than set sail for Recife where it arrived as scheduled on January 2nd, 2008.

Summary MARSUED IV (RV l'Atalante)

With the breakdown of the Merian at the end of 2007 the planned cruise MSM06/3 was, with an exceptional amount of support and commitment from both the Leitstelle, the ship´s operators and the Senatskommission für Ozeanographie, transferred onto the French vessel "l'Atalante". This change meant a reduction in working days from 20 to 12 which immediately lead to all planned work at Lilliput having to be cancelled. The N.O. "l'Atalante" left Recife harbour on schedule on the morning of 7th January 2008. There followed a 7 day transit to the working area at Turtle Pits where it arrived late in the evening of 13th January and began work with CTD stations to establish the strength and position of any hydrothermal plume. This began the sequence of activities which repeated each day – a night program consisting of CTD work or rock sampling with the volcanic corer interspersed with a day program of ROV dives. On days when the ROV needed maintainance the day program consisted of mapping or longer CTD stations. A total of 8 dives were completed on the Turtle Pits/Red Lion/Comfortless Cove vents, recovering hot and warm fluids, collecting macrofauna samples and testing several new sampling devices such as gas-tight water samplers and in situ fixation biological sampling tools. Three dives were also performed on the Inside Corner High region to examine crustal structure, returning rock samples from a 2km-high wall generated by a major

detachment fault. The penultimate day of the working period was marked by an attempt (unfortunately unsuccessful) to recover releasers from a University of Bremen mooring which did not surface followed by the deployment of a profiling mooring (which has since been lost) from IFM-GEOMAR. Early in the morning of 26th January the ship left the working area on course for Dakar where we docked at 08:00 on 31st January 2008.



Bathymetric map of the 5°S area showing the inside corner high.

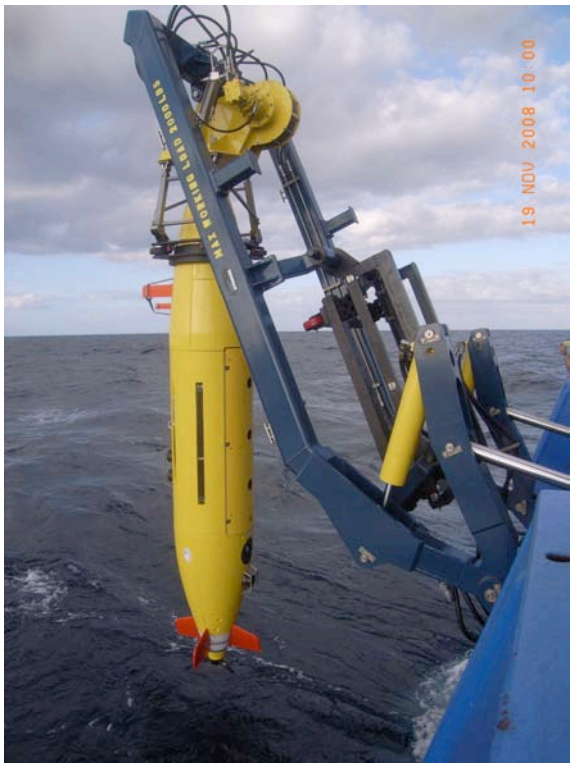
AUV operations on cruise P376 RV Poseidon

The Autonomous Underwater Vehicle (AUV) ABYSS, acquired with funds from the DFG for SPP 1144 and built in the USA by HYDROID LLC is based at IFM-Geomar in Kiel. The vehicle was tested for the first time at sea during Poseidon cruise 376.

The ABYSS system comprises the AUV itself, a control and workshop container, and a mobile Launch and Recovery System (LARS) with a deployment frame which was installed on the afterdeck of R/V POSEIDON. The self-contained LARS was developed by WHOI to support ship-based operations so that no Zodiac is required to launch and recover the AUV. The LARS is mounted on steel plates which are screwed on the deck of the ship.

For testing purposes several working areas close to the Canary Islands (Spain) were chosen spanning water depths between 50 m and 3600 m. The maximum water depth attained by the vehicle during the course of the cruise was 3500 m in an offshore area north of Gran Canaria. We were able to deploy and recover the AUV in weather conditions with a swell up to 2.5 m and wind speeds of up to 6 beaufort. For the recovery the nose float pops off when triggered through an acoustic command.

The float and the ca. 25 m recovery line drift away from the vehicle so that a grappnel hook can snag the line. The line is then connected to the LARS winch, and the vehicle is pulled up. The AUV dives with about 1 m/s whereas the ascent time is about 0.7 m/s or 1 m/s if ascent weight is dropped. Together with the deployment/recovery procedure the descent to the seafloor and the ascent back to the vessel took 3 hours at a water depth of 3500 m.



AUV "ABYSS" launched from RV Poseidon

All sensors of the base vehicle (including a sidescan sonar; pressure, temperature, conductivity, optical backscatter and eH-sensor; and an inertial navigation system that is aided by an Acoustic Doppler Current Profiler (ADCP) with bottom lock capabilities) worked nearly perfect during the entire test cruise. However the variable components of the vehicle configurations were not as successful. Prior to the cruise the pressure housing for the camera system failed pressure tests and so we could only test a provisional system down to 1000 m – this system worked well, however. The most important vehicle configuration, incorporating a RESON Seabat 7125 Multi-Beam system, did not produce results because of many hardware and software problems. These problems were so time consuming that during the entire 3-week test cruise no successful test of the third vehicle configuration (sediment echo sounder) could be completed. At the time of writing (January 2009) we are preparing for extensive post-cruise repairs and testing of the vehicle both at IFM-GEOMAR and, thanks to the kind support of the WTD71, at the military test range in Eckernförde.

SCOR 50th Anniversary Symposium in Woods Hole, Massachusetts, USA, 19-21 October 2008

This year the German Science Foundation suggested to send one young scientist involved in the priority program SPP 1144 "From Mantle to Ocean: Energy-, Material- and Life-cycles at Spreading Axes" to the 50th Anniversary Symposium in Woods Hole. During the last SPP 1144 workshop, Regina Schauer, a graduate student at the Max Planck Institute for Marine Microbiology, was nominated to participate. Regina's presentation was titled "Free-living microbial communities in different sediments of the Logatchev hydrothermal vent field: Diversity, Function and Ecological Significance".

My interest in biology was sparked in school by my biology teacher, who organized a lot of different exiting excursions and who loved inspiring discussions. Therefore, after school I enrolled at the University of Oldenburg to study biology. Early in my

undergraduate years, I developed a strong interest in the marine ecosystem. I completed the education as a scientific diver in Oldenburg in 2001, giving me the opportunity to join interesting projects in the Red Sea and at Helgoland. Following training in microbiology showed me the importance of microorganism in different biogeochemical cycles, and the fact that something so small can be so powerful impressed and motivated me to work in this field. During my diploma and my PhD thesis research I participated in expeditions to the deep-sea basins of the South-Atlantic Ocean and to the Mid-Atlantic Ridge.

My work is focused on the characterization of microbial communities in deep-sea sediments. Thereby, I am not only interested in investigating the microbial communities with different molecular approaches, but also the environmental conditions. Therefore, the cooperation with scientists of different fields, like geology and mineralogy is necessary, which I enjoy a lot. This interdisciplinary approach and the interacting with researches from other fields lead to a better understanding of the system and therefore of the interaction of the microorganism and the habitat.

I am looking forward to attend the 50th Anniversary Symposium and get to know other young scientists of different fields and to discuss my work in a bigger framework.

Announcements

EGU General Assembly, 19-24 April 2009, Vienna

The session “Deep-sea hydrothermal systems: new insights from experiments, theory and observations” is of special interest to SPP scientists.

Goldschmidt Conference, 21-26 June, Davos

There is a session “Hydrothermal processes at Mid-Ocean-Ridges: Temporal and spatial variability and impacts on biogeochemical cycling between mantle, crust and ocean.”

6th SPP 1144 - Workshop, 21-23 September 2009, Etelsen

Based on our positive experience during the last years, the workshop will be held again in Etelsen (near Bremen) from 21-23 September. An official invitation together with a registration form will be sent out by the DFG during summer 2009.

The workshop will be used to present the results of the Merian cruise MSM10/3 and M78/2 as well as the results of the funded SPP 1144 DFG-projects.

Data Management Report 2008

The data inventory for SPP 1144 is still growing. Currently (begin of December 2008) 780 data sets are stored, most of them accessible for the SPP community. A few data sets are still restricted to the PI but will be opened as soon as possible. A few other data sets are published in manuscripts; these data sets are openly available for the public. At the moment there are 30 SPP publications available and preparing the related data for archiving is in progress.

Metadata of eleven ROV-tracks carried out during MSM04/3 and related minifilms are also being prepared for inclusion into Pangaea.

The table and graph provide an overview of the contents of the archive regarding the different scientific disciplines and the various expeditions. It shows also the increase of data sets in some of the thematic areas.

Microbiological data are handled different to other data. Because genomic data are stored generally in appropriate databases (EMBL-EBI, European Bioinformatics Institute) we linked the data on the SPP website instead of archiving the data in Pangaea.

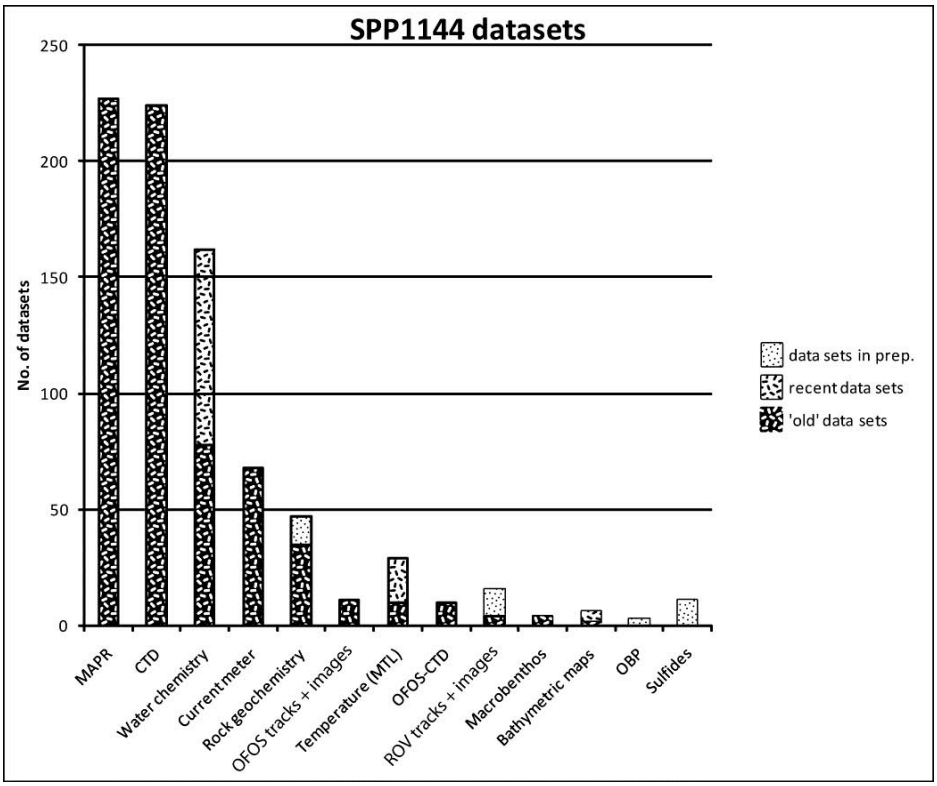
Please use the support page of the project data website for further information and examples http://www.pangaea.de/Projects/SPP1144/supp.html. On questions about data management, please contact: H.-J. Wallrabe-Adams, hwallrabe@pangaea.de, phone +49 (0)421 218 65592 or Sabine Lange, slange@ifm-geomar.de, phone +49 (0)431 600 2208.

NOTE: a new way of data publishing

Recently a new scientific journal has been established at Copernicus Publications which might be of interest to SPP 1144 scientists (*Earth System Science Data*, *ESSD*). The new journal is dedicated to publish articles on original research data according to the conventional fashion of publishing articles, applying the established principles of quality assessment through peer-review to datasets. The goals are to make datasets a reliable resource to build upon and to reward the authors by establishing priority and recognition through the impact of their articles. More information can be found on the *Earth System Science Data* web page (http://www.earth-system-science-data.net/). The data themselves can be stored at Pangaea as part of the SPP archive.

	Datasets *	Datasets, new	in prep at DM	Cruise(s)
Station list **				M60/3, M62/5ab, M62/4, M64/1, M64/2, M68/1, MSM03/2, MSM04/3, l'Atalante Leg1
MAPR	227			M62/5, M64/1, M64/2
CTD	224			M60/3, M62/5, M64/1, M64/2
Water chemistry	78	84		M62/5
Current meter	68			M62/5
Rock geochemistry	35		12	M60/3, M64/2, M41/2
OFOS tracks+images	11			M60/3
Temperature (MTL)	10	19		M60/3, M64/2
OFOS-CTD	10			M60/3
ROV tracks+images	4		11	M60/3, MSM04/3
Macrobenthos	4			M60/3, M64/1
Bathymetric maps/data	1	5		M60/3
OBP time series			3	M64/2
Sulfides			11	M64/1, M68/1

*) One or more data set(s) per station, 262 stations **) 749 stations in total



List of published and accepted SPP manuscripts

- **Almeev, R., Holtz, F., Koepke, J., Parat, P., and Botcharnikov,R.E.** (2007) The effect of H_2O on olivine crystallization in MORB: Experimental calibration at 200 MPa. American Mineralogist, 92 (4), 670-674. #0006
- **Almeev, R., Holtz, F., Koepke, J., Haase, K. and C.W. Devey** (2007) Depths of partial crystallization of H_2O-bearing MORB: Phase equilibria simulations of basalts at the MAR near Ascension Island (7-11°S). J. Petrology, 1-21. #0014
- **Amini, M., Eisenhauer, A., Böhm, F., Fietzke, J., Bach, W., Garbe-Schönberg, D., Bock, B., Lackschewitz, K.S. and F. Hauff** (2008) Calcium isotope ($\delta^{44/40}$Ca) fractionation along hydrothermal pathways, Logatchev Field (Mid-Atlantic Ridge, 14°45'N). Geochim Cosmochim Acta, 72 (16), 4107-4122. #0025
- **Augustin, N., Lackschewitz, K.S., Botz, R., Eisenhauer, A.,Garbe-Schönberg, D., Kuhn, T., Paulick, H. and M. Schmidt.** Alteration processes at the ultramafic-hosted Logatchev hydrothermal field, MAR 14°45' N: Trace elements and isotope signatures as tracers for water/rock and melt/rock interaction. Accepted by Chemical Geology
- **Augustin, N., Lackschewitz, K.S., T. Kuhn, and C.W. Devey** (2008) Mineralogical and chemical mass changes in mafic and ultramafic rocks from the Logatchev hydrothermal field (MAR 15°N). Marine Geology, 256 (1-4), 18-29. doi:10.1016/j.margeo.2008.09.004 #0030
- **Blumenberg, M., Seifert, R., Petersen, S. and W. Michaelis** (2007) Biosignatures present in a hydrothermal massive sulfide from the Mid-Atlantic Ridge. Geobiology, 5 (4), 435-450. #0013
- **Devey, C.W., Lackschewitz, K.S. and E. Baker** (2005) Hydrothermal and volcanic activity found on the southern Mid-Atlanic Ridge. EOS, 86 (22), 209-216. #0001
- **Dubilier, N., Bergin C. and C. Lott** (2008) Symbiotic diversity in marine animals: the art of harnessing chemosynthesis. Nature Reviews Microbiology, 6, 725-740, doi:10.1038/nrmicro1992. #0028
- **Duperron, S., Bergin, C., Zielinski, F., Pernthaler, A., Dando, P., McKiness, Z.P., DeChaine, E., Cavanaugh, C.M., and N. Dubilier** (2006) A dual symbiosis shared by two mussel species, Bathymodiolus azoricus and B. puteoserpentis (Bivalvia: Mytilidae), from hydrothermal vents along the northern Mid-Atlantic Ridge. Environmental Microbiology, 8 (8), 1441-1447. #0002
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- **Fabian, M. and H. Villinger** (2008) Long-term tilt and acceleration data from the Logatchev Hydrothermal Vent Field, Mid-Atlantic-Ridge, measured by the Bremen Ocean Bottom Tiltmeter. G^3, 9 (7). doi:10.1029/2007GC001917. #0026

- **Gärtner, A., Wiese, J. and J. Imhoff** (2008) Amphritea atlantica gen. nov., sp. nov., a gammaproteobacterium from the Logatchev hydrothermal vent field. International Journal of Systematic and Evolutionary Microbiology, 58, 34-39. doi:10.1099/ijs.0.65234-0. #0029
- **Haase, K.M., S. Petersen, A. Koschinsky, R. Seifert, C. Devey, N. Dubilier, S. Fretzdorff, D. Garbe-Schönberg, C.R. German, O. Giere, R. Keir, J. Kuever, K. Lackschewitz, J. Mawick, H. Marbler, B. Melchert, C. Mertens, H. Paulick, M. Perner, M. Peters, S. Sander, O. Schmale, J. Stecher, H. Strauss, J. Süling, U. Stöber, M. Walter, S. Weber, U. Westernströer, D. Yoerger, and F. Zielinski** (2007) Young volcanism and related hydrothermal activity at 5°S on the slow-spreading southern Mid-Atlantic Ridge. G^3, 8 (11). #0011
- **Ivanenko, V.N., Arbizu, P.M. and J. Stecher** (2006). Copepods of the family Dirivultidae (Siphonostomatoida) from deep-sea hydrothermal vent fields on the Mid-Atlantic Ridge at 14°N and 5°S. Zootaxa 1277: 1-21. #0003
- **Ivanenko, V.N. Martínez Arbizu, P. and J. Stecher** (2006) Lecithotrophic nauplius of the family Dirivultidae (Copepoda; Siphonostomatoida) hatched on board over the Mid-Atlantic Ridge (5°S). Marine Ecology, 28 (1), 49-53. doi:10.1111/j.1439-0485.2006.00142.x. #0007
- **Keir, R. S., Schmale, O., Walter, M., Sültenfuß, J., Seifert, R. and M. Rhein** (2008) Flux and dispersion of gases from the "Drachenschlund" hydrothermal vent at 8°18'S, 13°30'W on the Mid-Atlantic Ridge. Earth and Planetary Science Letters, 270 (3), 338-348. #0015
- **Koschinsky, A., Garbe-Schönberg, D., Sander, S., Schmidt, K., Gennerich, H. H. and H. Strauss** (2008) Hydothermal venting at p-T conditions above the critical point of seawater, 5°S on the Mid-Atlantic Ridge. Geology 36 (8), 615-618, doi:10.1130/G24726A.1 #0016
- **Melchert, B., Devey, C.W., German, C.R., Lackschewitz, K.S., Seifert, R., Walter, M., Yoerger, D.R., Baker, E.T., Paulick, H., and K. Nakamura** (2008) First evidence for high-temperature off-axis venting of deep crustal/mantle heat. The Nibelungen Hydrothermal Field, Southern Mid-Atlantic Ridge. Earth and Planetary Science Letters, 275, 61-69. doi:10.1016/j.epsl.2008.08.010. #0027

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- **Meyer, B. and J. Kuever** (2007) Molecular analysis of the distribution and phylogeny of dissimilatory adenosine-5'-phosphosulfate reductase-encoding genes (aprBA) among sulfur-oxidizing prokaryotes. Microbiology, 153, 3478-3498. doi 10.1099/mic.0.2007/008250-0. #0019
- **Meyer, B., Imhoff, F. and J. Kuever** (2007) Molecular analysis of the distribution and phylogeny of the soxB gene among sulfur-oxidizing bacteria – evolution of the Sox sulfur oxidation enzyme system. Environmental Microbiology, 9 (12), 2957-2977. doi 10.1111/j.1462-2920.2007.01407.x. #0020
- **Meyer, B. and J. Kuever** (2007) Molecular analysis of the diversity of sulfate-reducing and sulfur-oxidizing prokaryotes in the environment, using aprA as functional marker gene. Applied and Environmental Microbiology, 73 (23), 7664-7679. doi 10.1128/AEM.01272-07. #0021
- **Meyer, B. and J. Kuever** (2007) Phylogenetic diversity and spatial distribution of the microbial community associated with the caribbean deep-water sponge polymastia cf. corticata by 16S rRNA, aprA, and amoA gene analysis. Microbial Ecology, online. doi 10.1007/s00248-007-9348-5. #0022
- **Meyer, B. and J. Kuever** (2008) Homology Modeling of Dissimilatory APS Reductases (AprBA) of Sulfur-Oxidizing and Sulfate-Reducing Prokaryotes. PloS one, 3 (1): e1514. doi 10.1371/journal.pone.0001514. #0023
- **Pasava, J., Vymazalová, A., and S. Petersen** (2007) PGE fractionation in seafloor hydrothermal systems: examples from mafic- and ultramafic-hosted hydrothermal fields at the slow-spreading Mid-Atlantic Ridge. Mineralium Deposita, 42 (4), 423-431. #0008
- **Perner, M., Seifert, R., Weber, S., Koschinsky, A., Schmidt, K., Strauss, H., Peters, M., Haase, K. and J.F. Imhoff** (2007) Microbial CO(2) fixation and sulfur cycling associated with low-temperature emissions at the Lilliput hydrothermal field, southern Mid-Atlantic Ridge (9°S). Environmental Microbiology, 9 (5), 1186-1201. #0005
- **Perner, M., Kuever, J., Seifert, R., Pape, T., Koschinsky, A., Schmidt, K., Strauss, H. and J.F. Imhoff** (2007) The Influence of Ultramafic Rocks on Microbial Communities at the Logatchev Hydrothermal Field, located 15°N on the Mid-Atlantic Ridge. FEMS Microbiology Ecology, 61, 97-109. #0009
- **Sander, S.G., A. Koschinsky, G. Massoth, M. Stott and K.A. Hunter** (2007) Organic complexation of copper in deep-sea hydrothermal vent systems. Environmental Chemistry, 4 (2), 81-89. #0010
- **Schmidt, K., Koschinsky, A., Garbe-Schönberg, D., de Carvalho, L.M. and R. Seifert** (2007) Geochemistry of hydrothermal fluids from the ultramafic-hosted Logatchev hydrothermal field, 15°N on the Mid-Atlantic Ridge: Temporal and spatial investigation. Chemical Geology, 242 (1), 1-21. #0004
- **Zielinski, F.U., Pernthaler, A., Duperron, S., Raggi, L. Giere, O., Borowski, C. and N. Dubilier** (2009) Widespread occurrence of an intranuclear bacterial parasite in vent and seep bathymodiolin mussels. Accepted by Environmental Microbiology. #0024

SPP members in the news

Kieler Nachrichten – 17. Oktober 2008

Er kann ganz tief sinken

Tauchroboter forscht in bis zu 6000 Metern Meerestiefe – Im November erster Einsatz vor den Kanarischen Inseln

Kiel – „ABYSS" verstärkt die Unterwasserflotte des Kieler Leibniz-Instituts für Meereswissenschaften (IFM-GEOMAR). Der 2,3 Millionen Euro teure Tauchroboter kann den Meeresgrund ohne Kabelverbindung zu Begleitschiffen in bis zu 6000 Metern Meerestiefe erforschen. Im November taucht „ABYSS" erstmals im Atlantik vor den Kanarischen Inseln ab.

Von Volker Rebehn

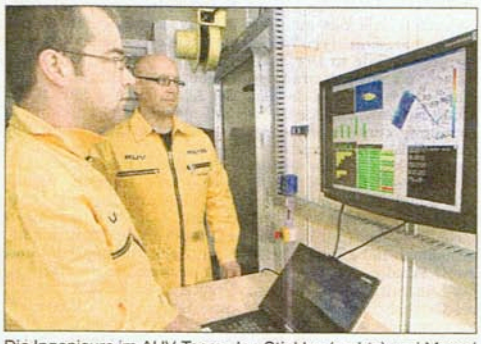
Das Leibniz-Institut für Meereswissenschaften (IFM-GEOMAR) stellte das autonome Unterwasserfahrzeug (AUV) gestern der Öffentlichkeit vor. 3,98 Meter lang und 885 Kilogramm schwer ist das Forschungsgerät. Fotos Rebehn

Prof. Peter Herzig und Dr. Klas Lackschewitz grübelten gestern Vormittag zunächst, ob die Form von „ABYSS" mehr einer Zigarre oder einem Torpedo ähneln könnte. Alleine wegen der Maße – Länge 3,98 Meter, Gewicht 885 Kilogramm – einigten sich der GEOMAR-Direktor und der wissenschaftliche Leiter des „ABYSS"-Teams auf die Ähnlichkeit mit einem Unterwassergeschoss. Unter Wasser wird das System auch eingesetzt. Mit einem Geschoss hat es aber überhaupt nichts zu tun. „ABYSS" – der Name steht für „Autonomes benthisches Hydrothermal-Suchsystem" – dient vielmehr der friedlichen Erforschung der Tiefsee.

Das Besondere des neuen Systems: Nachdem den Bordcomputern vor Tauchbeginn Ziel, Kurs und Aufgabe einprogrammiert worden sind, startet „ABYSS" seinen Weg durch die Tiefsee. Bestückt mit verschiedenen Echoloten und Sensoren, kann es dabei selbstständig unter anderem den Meeresboden kartieren, fotografieren und zahlreiche Messwerte sammeln. Bis zu 24 Stunden kann eine Fahrt dauern. Das bis zu acht Kilometer pro Stunde „schnelle" Gerät ist speziell für das Auffinden und die Kartierung von heißen Tiefseequellen und Unterwasservulkanen ausgelegt. In diesen Zonen werden auch Rohstoffe wie Erze und Kupfer vermutet.

„Das autonome Unterwasserfahrzeug oder abgekürzt AUV bedeutet einen Quantensprung", sagte Peter Herzig. Sein Einsatz brächte einen enormen Zeitvorteil im Vergleich zu ferngelenkten Geräten wie etwa dem ROV-System. Dieses ist über ein Kabel mit dem Forschungsschiff verbunden und kann vor allem punktuell eingesetzt werden. Jetzt könnten Ozeangründe „quadratkilometerweise" in sehr viel kürzerer Zeit abgefahren werden. Das spare zudem, sagte Herzig mit Blick auf die bis zu 35 000 Euro Tageskosten von Forschungsschiffen. Diese könnten jetzt effektiver genutzt werden oder sogar beide Systeme bei einer Forschungsfahrt parallel eingesetzt werden.

Die Deutsche Forschungsgemeinschaft (DFG) hat den Tauchroboter finanziert. Er wird im Rahmen des von der DFG mit mehr als einer Million Euro geförderten Schwerpunktprogramms „Vom Mantel zum Ozean" eingesetzt. Dieses auf sechs Jahre angelegte Projekt wird vom IFM-GEOMAR koordiniert. Nach den Testfahrten vor den Kanarischen Inseln folgt der erste wissenschaftlicher Einsatz Anfang August 2009 am mittelatlantischen Rücken in der Nähe des Äquators. Dort liegt ein Hauptuntersuchungsgebiet des Schwerpunktprogramms. Wird „ABYSS" im Heimatstandort Kiel nicht eingesetzt, kann es von anderen deutschen Meeresforschungseinrichtungen genutzt werden.



Die Ingenieure im AUV-Team, Jan Sticklus (rechts) und Marcel Rothenbeck, sind für den technischen Einsatz von „ABYSS" zuständig.

Vom Forschungsschiff „Poseidon" wird „ABYSS" erstmals eingesetzt.

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