After a year’s delay due to various beaurocratic challenges, the HERMES team from Odessa National University finally commissioned and completed their cruise in the Black Sea aboard RV Vladimir Parshin in late September this year. The cruise was conducted by a joint team of researchers from ONU, UKRSCEM, and the Institute of Mineral Resources at the Ukrainian Academy of Sciences, including many young scientists. The lengthy delay to the cruise left the team with no choice but to work at sea under unfavorable weather conditions. Severe storms drove the ship to shelter at least twice, but in spite of this 46 stations on the NW shelf and continental slope of the Black Sea in water depths of 35–1000 m were sampled by grab and short (< 2 m) gravity cores.

The cruise was designed to: (1) study hotspot ecosystems that are strongly physically mediated and associated with dynamic geological and/or hydrogeological structures, such as unstable continental slopes, cold seeps, and mud volcanoes; (2) monitor the taxonomic diversity and spatial distribution of pelagic and benthic communities along oxygen gradients in order to trace their characteristics and identify index species resistant to oxygen depletion; (3) collect new geological and geochemical data for an improved understanding of the natural drivers that control hotspot ecosystems (fluid flow, sediment transport, seabed composition and architecture) through ultrasound mapping of the relief, geological sampling (grab and gravity core), and seabed monitoring of fluid escape; and (4) trace fluctuations in oxygen regime and development of hypoxic and anoxic conditions over time with regard to sapropel formation.
Challenges in the Black Sea (continued from front page)

In total, over 52 m of sediment cores were recovered and subsampled on board for grain-size, geochemical (light and heavy hydrocarbon gases and trace elements), mineralogical, spore and pollen, meio- (Nematodes and Loricifera) and micropaleontological, e.g., foraminifera and ostracoda, isotope analysis, and radiocarbon dating. Physical (water depth, temperature, density, visibility) and chemical (salinity, pH, $O_2$ and $H_2S$) properties of marine water were obtained on board. Attention will now turn to processing these samples.

Evolution of the Black Sea-Mediterranean corridor over the past 30ky

The Fourth Plenary Meeting of IGCP Project 521 ‘Black Sea-Mediterranean Corridor during the last 30 ky: Sea level change and human adaptation’ (2005–2009) and INQUA Project 0501 ‘Caspian-Black Sea-Mediterranean Corridor during the last 30 ky: Sea level change and human adaptive strategies’ (2008-2010) took place on 4-16 October, 2008. Amongst the meeting’s convenors were HERMES partners Nicolae Panin (GeoEcoMar) and Valentina Yanko-Hombach (Odessa National University).

IGCP 521-INQUA 0501 meetings address the status of our knowledge over a range of subjects, including scientific approaches to integrating environmental, anthropological, ethnological, and archaeological data in order to trace the history of ancient humans in the region and predict their future development in coastal zones under various sea-level scenarios. They introduce young scientists, particularly from the Eastern countries, to new analytical techniques and state-of-the-art interpretation of data. Additionally, they encourage east-west dialogue and integrate researchers from different countries into the international R&D community.

The meeting programme comprised a 3-day technical meeting, which included a special HERMES-related session on Black Sea hotspot ecosystems, followed by an 8-day fieldtrip. A number of HERMES scientists presented results concerning the lithology, biochemistry, and micropaleontology of mud volcanoes and high-intensity cold seeps on the bottom of the Black Sea and Sea of Azov. Other HERMES presentations focused on calcareous nanoplankton, ostracoda,foraminifera, and meio- and macrobenthos of the Black Sea, and a talk by HERMES Black Sea co-ordinator Gilles Lericolais (Ifremer) indicated that there was a significant influx of Mediterranean water into the Black Sea at approximately 8.4 ka (14C yr).

In total, over 160 scientists attended the meeting and fieldtrip, and the proceedings will be published in a special volume of the journal Quaternary International. Additionally, a collective monograph concentrating on the most contradictory questions in the geosciences and archaeology of the ‘Corridor’ will be produced.

For more information on IGCP Project 521-INQUA 0501, please visit http://www.avalon-institute.org/IGCP/.
Monothalamous Foraminifera and gromiids from the Håkon Mosby Mud Volcano and surrounding areas

A.J. Gooday (NOCS), O. E. Kamenskaya (IORAS) & T. Soltwedel (AWI)

The Håkon Mosby Mud Volcano (HMMV - right) has been the focus of numerous expeditions since it was discovered in 1989. Many benthic taxa associated with HMMV have been studied, including hard-shelled foraminifera. However, our knowledge of one important group, the soft-walled monothalamous (single-chamber) foraminifera, has remained incomplete. These fragile protists usually are very diverse and play an important role in deep-sea benthic communities.

Material for our study was obtained during the R/V POLARSTERN expedition ARK XVIII/1 in summer 2002. Sediment samples were taken with a multicorer from different habitats within and around the HMMV: bacterial mats, fields of ‘pogonophores’ (frenulate siboglinids), reduced sediments and areas of ‘normal’ seafloor outside the caldera.

Species richness varied between habitats. Assemblages from the bacterial mat were the least diverse, comprising only 5 species of monothalamous foraminifera and gromiids. Abundances ranged from 3 to 15 ind./10 cm$^2$. All specimens were present in the upper two cm of the sediment. Samples from the pogonophoran fields and sediments outside the caldera were more diverse, yielding 17-19 species. Density of several species exceeded 500 ind./10 cm$^2$, sometimes with the peak of density in subsurface layers.

Several papers are in preparation with descriptions of new taxa of soft-walled foraminifera, details of foraminiferan faunas from different HMMV habitats, and a discussion of the importance of soft-walled forms among foraminiferan assemblages associated with this important mud volcano.
The first in situ videos of pelagic bioluminescence have been collected from ICDeep, the new HERMES funded bioluminescence camera. Designed and built by Oceanlab (University of Aberdeen), the ICDeep marks an advance in in-situ bioluminescence imaging. The camera integrates ICCD (Intensified Charge Coupled Device) technology with a custom built computer system for device control and image capture. The capability of the ICDeep surpasses previous in-situ bioluminescence imaging technology in terms of sensitivity control and recording capacity. The camera is currently rated to 4000m, soon to be extended to 6000m.

Video was captured from the pelagic realm in the Strait of Sicily and West Ionian Sea (R/V Urania, 5-16 September 2008) from the sub-surface layer (200m) to the seafloor. The ICDeep was mounted on the CTD rosette and focused on a ‘splat-screen’ (see photo, right). During the CTD downcast the impact of the ‘splat-screen’ on the animals stimulates the emission of bioluminescence which is recorded by the camera.

Video imaging of the bioluminescence enables the density of bioluminescent animals through the water column to be determined. The different emission types (left) indicate the type of bioluminescent fauna present, ranging from the small flash of a copepod to the chain-like emission from a siphonophore.

The ICDeep can also be used in the benthic realm to observe the bioluminescent behaviour of animals attracted to bait placed in the field of view. A red light, which is invisible to most deep-sea animals, is used to illuminate the scene at specified intervals to enable the observation and identification of the animals present, without their disturbance.

The study of bioluminescence is key to understanding the visual ecology of the deep-sea, given that it is the only visually relevant source of light beyond the penetration of sunlight.
Impact of dense shelf water cascading on the transfer of organic matter to the deep western Mediterranean Basin

The team comprising scientists from CNRS-CEFREM, University of Barcelona and Marine Science Institute (CSIC) has recently published HERMES results in the journal Geophysical Research Letters. Their findings show the impact of the winter 2005-06 dense shelf water cascading event on the amount and origin of settling organic particles in the western Gulf of Lion.

During winter 2005-2006, particle fluxes and near-bottom currents were measured in and around the Lacaze-Duthiers and Cap de Creus submarine canyons. Current anomalies show the occurrence of a major dense shelf water cascading event down to the slope, the latest recorded up to date in the area. Concomitant increased total mass fluxes highlight the ability of cascading waters to transport large amounts of coarse sediment and organic matter, which is predominantly of terrestrial origin. In addition, results reveal that the current regime and associated grain size sorting is the responsible for a geochemical gradient of settling organic particles along the slope. Dense shelf water cascading is thus likely to have profound implications for food availability for along-canyon and deep-basin benthic ecosystems.


More data on methanogen diversity and AOM-related microbes from the eastern Mediterranean mud volcanoes.

In this year’s final issue of ‘Geobiology’ a paper will appear focusing on the diversity of methanogens, based on the mcrA gene, in the sediments of an active site at the Kazan mud volcano, East Mediterranean Sea. The mcrA gene was detected only at 15 and 20 cmbsf from a 40-cm long push core. The bacterial and archaeal 16S rRNA gene diversity revealed a dominant AOM-related microbial community at these depths. This community was dominated by Methanosarcinales (ANME-2c) and sulphate-reducing delta-proteobacterial representatives.

Trans-Atlantic corals group meet in Woods Hole

The Trans-Atlantic Coral Ecosystem Study ‘TRACES’ held its third workshop at Woods Hole Oceanographic Institution on 24-25 October 2008. The TRACES project was launched in February 2008 with North American and European workshops to discuss and prioritise research areas for this first ocean basin-scale study of cold-water corals and their palaeoclimatic archives.

The Woods Hole meeting began with a morning of talks reviewing the scientific background to TRACES and a marine technology lecture on the new hybrid ROV-AUV Nereus, an innovative vehicle designed to operate either autonomously or by remote control at depths up to 11 km. The British Consul for Science and Innovation in Boston, Dr Stefan Winkler, spoke on international funding and routes for collaboration. The talks were followed with a tour of WHOI’s Deep Submergence Laboratories where Nereus was developed. TRACES researchers from France, Spain, Norway, USA and UK then met for a day-long Science Plan writing workshop. The TRACES Science Plan summarises the aims of the programme into two research themes, ‘Ecosystem’ and ‘Climate Records’, with other ‘Environmental Context’ themes, such as habitat mapping and oceanography, which relate to all research aspects of the programme. The Science Plan also includes summaries of key policy drivers in Canada, the European Union, USA and on the High Seas and suggests policy areas where marine governance research is needed.

The TRACES team now includes over 100 individuals from 14 nations. The next project workshop will be held on 3 December 2008 at the International Symposium on Deep-sea Corals (Wellington, New Zealand).

For more information see www.lophelia.org/traces or contact Murray Roberts (Scottish Association for Marine Science & University of North Carolina, robertsjm@uncw.edu).

Acknowledgments: TRACES is supported by a grant from the European Commission (Contract No. MOIF-CT-2006-040018). The European workshop was sponsored by the UK Natural Environment Research Council and Scottish Association for Marine Science. The North American workshop was sponsored by the Canadian Department of Fisheries and Oceans, Center for Marine Science University of North Carolina Wilmington, US Geological Survey, NOAA National Undersea Research Center, Environmental Defense, Oceana, Marine Conservation Biology Institute and the US South Atlantic Fishery Management Council. The TRACES Science Plan writing workshop at Woods Hole was sponsored by the British Consulate-General Boston.

HERMES deep-sea fish workshop at Oceanlab University of Aberdeen

This workshop met on 31 October to progress the final stage of analysis of four decades of trawl data from the continental slopes, rise and plains of the Porcupine Seabight and Abyssal Plain of the North East Atlantic Ocean. Evidence for long term change in this area and the potential impacts of fisheries was discussed together with plans for revision and writing of papers.

Left to Right: Nikki King, David Bailey, Jasmin Godbold, Monty Priede, Martin Collins, John Gordon, Alain Zuur.
The World Conservation Congress of IUCN takes place every four years. The October 2008 event brought more than 8,000 participants to Barcelona from governments, NGOs, business, the UN and academia. They gathered for 10 days to explore ideas and solutions and implement actions for a diverse and sustainable world.

As part of the Congress, HERMES, together with the US-based NGO Natural Resource Defense Council (www.nrdc.org) organised a workshop entitled: "Deep-Sea Science, Governance and Management: their importance to our life". The rationale for the workshop was that we have limited knowledge about deep sea but evidence of severe direct and indirect human impacts. Deep-sea science has many different raison d’être beyond enhancing our knowledge about the ecosystems and providing explanations of the world. It helps us to identify and assess issues and threats to these ecosystems; it enhances our understanding of the roles of the deep sea in planetary cycles; it contributes to monitoring the state and evolution of ecosystems; and it provides knowledge to support the development of policy and sustainable management strategies. But science also contributes to raising awareness and willingness to act, and - importantly - to make people dream.

About 70 participants attended the workshop. They first heard a presentation by Elliott Norse from the Marine Conservation Biology Institute. Elliott introduced them to "The Biggest, Darkest, Strangest and Least-known Ecosystem on Earth". He described the conditions and the ecosystem in the deep sea, particularly highlighting the importance of the species found on the seafloor. He then emphasised the anthropogenic threats to these ecosystems.

Two HERMES scientists – Antonio Dell’Anno from the Polytechnic University of Marche and Pere Puig from the Institut de Ciències del Mar of Barcelona – went on to present some key recent scientific results and their relation to deep-sea governance and management. Antonio addressed the key roles of deep-sea ecosystems in the sustainable functioning of our biosphere and human well-being, because of their importance for global biochemical processes and of the goods and services they provide – including regulating services (e.g. climate regulation) and provisioning services (e.g. food and chemical compounds). By exploring the case of the deep Mediterranean Basin, Antonio showed that deep-sea ecosystems are fragile and vulnerable to climate forcing and respond very quickly. Pere presented the case of the interaction between dense shelf water cascading in the north western Mediterranean and populations of the deep-sea red shrimp Aristaeus antennatus. He explored the consequences for fisheries management and showed how good collaboration between scientists and fishermen led to the development of a draft sustainability management plan, which is now being considered by the Catalan and Spanish fisheries administrations.

Alex Rogers, from the Zoological Society of London, also stressed the high biodiversity in the deep and the important role played by deep-sea ecosystems in the Earth’s system. He then addressed the major human-induced threats to high seas and deep oceans ecosystems, in particular deep-sea fishing, ocean acidification, ocean fertilisation for carbon sequestration, deep-sea mining, dumping, and bioprospecting.

A lively discussion ensued where participants from as diverse origins as the fishing industry, national authorities, industry federations, the conservation sector, international organisations, research institutes and environmental NGOs asked questions and made comments on how the governance of the deep.

A policy brief synthesising the key points addressed will soon be available.

The workshop was prepared jointly by Lisa Speer (NRDC), Kristina Gjerde (IUCN), and Sybille van den Hove (Median and HERMES).
November

World Conference on Marine Biodiversity
Valencia, 11-15 November 2008
A global conference to review the current understanding of marine biodiversity, its role in marine ecosystem functioning and its socio-economic context. For more information see www.marbef.org/worldconference

December

Deepsea Coral Symposium 2008
Wellington, 1-5 December 2008
This international event will focus on scientific exchange, establishing collaborative partnerships, and help provide an understanding of the critical factors for conserving deepsea corals and cold water coral reefs. For more details: http://coral2008.niwa.co.nz

HERMES Gulf of Cadiz workshop
NOCS, 9 December 2008
A working meeting for all HERMES scientists involved in research in the Gulf of Cadiz to discuss results, publications and future research. For more details, please contact Vikki Gunn.

2012 Marine Targets: European Marine Strategy and Issues in th High Seas
Brest, 9-11 December 2008
This event is coordinated by MEEDDAT with Ifremer and the French Marine Protected Areas Agency. Attendance by invitation only.

January

HERMES Portuguese canyons workshop
NOCS, 20 January 2009
A working meeting for all HERMES scientists involved in research in the Portuguese canyons to discuss data, results, publications and future research. For more details, please contact Vikki Gunn.

February

TTR-17 post-cruise meeting & conference
Granada, 2-5 February 2009
The theme of this international conference is ‘Geo-marine Research on the Mediterranean and European-Atlantic margins’. Full information will be available shortly at http://www.ugr.es/~ttr17

HERMES now has its own YouTube channel! Hosting a range of video clips from ROV missions and lander cameras, scientists and the public can now access short clips of HERMES research in the deep sea. Simply go to http://uk.youtube.com/HERMESproject or search for ‘HERMESproject’ in the Channels area on the YouTube front page (www.youtube.com). The HERMES channel currently has 18 video clips, ranging from methane bubbles at Darwin mud volcano, to bioluminescence in the Porcupine Seabight. We plan to expand the resources over the coming months - new video clips from HERMES partners and associates are very welcome. Contact Vikki Gunn (vkg@noc.soton.ac.uk) for more details.

HERMES Iberian margin workshops
Two 1-day workshops on the Gulf of Cadiz and Portuguese margin canyons will take place on 9 December 08 and 20 January 09 respectively. The workshops will be held at NOCS in Southampton (UK), and will take the form of working meetings for integration and discussion of data and results. See calendar, left.

HERMES final meeting registration...
...and call for abstracts will open in late November. The final meeting will take place at the Tivoli Almansor hotel just outside Faro, Portugal on 2-6 March 2009, and will comprise a mix of plenary sessions and WP working meetings. Check the website for further details in due course.

Next issue...
The next issue of the HERMES newsletter will be published in January 2009. To submit articles, please email your contributions to Vikki Gunn (vkg@noc.soton.ac.uk) by 12 January 2009.