biozone are investigated in order to show processes and climate associated controlling factors during the deposition of the lower Albian OAE 1B. The black shale intervals are characterized by the enhanced accumulation and preservation of marine derived organic matter as determined by Rock-Eval pyrolysis and organic petrology. The presence of laminated sediments, the relationships between organic carbon, iron and total sulfur, pyrite size analysis and trace metal enrichment indicate the periodic prevalence of anoxic conditions in the pore waters which may have extended at times into the bottom waters. Changes in the mineralogical composition throughout the OAE 1B interval, i.e. quartz content and clay mineral assemblage, result in the variation of the major element chemistry and are probably related to cyclic climatic changes in Northern Africa combined with a flooding of coastal lowlands during an overall transgressive phase in the lower Albian. The observed geochemical signatures on different scales demonstrate a genetic link between the climate system on land and processes in the deep ocean during the deposition of the OAE 1B in deep water environments of the western North Atlantic.

Organic matter from the ejecta blanket of the Ries crater, southern Germany: Detecting thermal effects related to the impact?

HOFMANN, P., SCHWARK, L. & LEYTHAEUSER, D.

Geologisches Institut, Universität zu Köln, Zülpicher Str. 49a, D-50674 Köln

Organic matter in sediments comprises a sensitive monitor for past thermal conditions. Dispersively distributed particulate organic matter (kerogen) reacts on increasing temperatures through the conversion of solid organic matter into liquids (e.g. hydrocarbons). This transformation process is accompanied by compositional changes of the residual solid organic matter mainly caused by the loss of hydrogen, carbon and oxygen.

The energy released during shock wave metamorphism of sedimentary strata caused by an impact event is known to generate shock induced temperatures ranging from a few degrees centigrade up to 1200 °C, depending on the intensity of shock wave metamorphism. This sudden rise in temperature is expected to leave traces in the residual sedimentary organic matter surviving the impact event.

In order to evaluate temperature induced effects on organic matter in association with an impact event, we investigated organic matter rich clasts from the ejecta blanket of the Ries impact, which occurred approximately 14.7 million years ago.

The sedimentary strata deposited in the Ries area ranges from Permian to Tertiary in age. One stratigraphic interval, the Jurassic Posidonia Shale, which consists of black shales, is known to be particularly rich in organic matter of marine origin. Fragments of the Posidonia Shale were incorporated in the ejecta (polymictic breccia) of the Ries impact. We collected samples of Posidonia Shale fragments of the ejecta blanket, from quarries at Harburg, Aumühle and Gundelsheim, which are located within and close to the impact crater. In addition samples from a natural outcrop of the Posidonia Shale at Hesselberg, near Wittelshofen, approximately 10km outside of the crater rim were studied. The samples were analyzed for organic carbon content, inorganic carbon content and sulfur content. The composition and degree of thermal stress on the solid organic matter was determined by pyrolytic techniques (Rock Eval Pyrolysis).

Our results show a continuous decrease in organic carbon content, carbonate content and sulfur content of the Posidonia Shale samples when comparing results from sampling localities successively closer to the crater center. This decrease in the investigated bulk parameters is accompanied by a drop in pyrolysis yields. We interpret the observed regional pattern as an expression of the temperature field during the impact event.

Sediment transport at the upper slope of the Sesoko fringing reef, Okinawa, Japan

HOHENEGGER, J. & YORDANOVA, E.

Universität Wien, Institut für Paläontologie, Geozentrum Althanstrasse, A-1090 Wien

Living and death assemblages of benthic foraminiferal species were compared at a NW-Pacific island slope. Two transects with different morphology were chosen, one demonstrating decreasing, the other slightly increasing steepness. Intensities of depth transport could be estimated by measuring differences between distribution parameters of living individuals and empty tests in combination with grain-size parameters of other bioclasts. Three factors were shown to induce depth transport:

1) traction intensities caused by offshore bottom currents or the frequent tropical cyclones that cross the investigation area,
2) slope steepness, and
3) differences in test buoyancies.

The complex slope topography in connection with the exposition of the coast to tropical storms leads to sediment input from surrounding shallow areas. Sediment from backreef regions is transported into the fore reef during the waning storm, while relict sediments are reworked in the deeper slope during these episodic events. Both factors, in combination with down-slope transport and slope inclination, can be demonstrated as important factors explaining sediment distribution on a fore-reef slope.

Der Stubensandstein im Süddeutschen Keuper: Reservoir-/Aquifer-Charakterisierung und klimagesteuerte Sedimentationsdynamik

HORNUNG, J. & AIGNER, T.

Universität Tübingen, Geologisches Institut, Sigwartstraße 10, D-72076 Tübingen, jens.hornung@uni-tuebingen.de

Das süddeutsche Keuperbecken eignet sich durch seine vom offenen Meer abgeschlossene Lage, sein flaches Relief und durch wahrscheinlich nur geringe tektonische Bewegungen in idealer Weise dazu den Einfluß des Klimas auf die Ablagerungsdynamik zu untersuchen.

Das Arbeitsgebiet umfasst Mittelwürttemberg bis Franken, der Daten-Schwerpunkt liegt dabei in Zentral-Württemberg. Die Datenbasis umfasst 12 Großaufschlüssen mit einer Wandfläche bis zu 20.000 m^2 pro Aufschluß, 5 Einzelbohrungen, 1 Bohrungscluster mit 6 Einzelbohrungen und 2 Bohrungscluster mit jeweils ca. 20 Einzelbohrungen.

Die Arbeitsweise orientiert sich am Aufschluß-Analog-Konzept, welches seit Jahren in der Erdölindustrie angewandt wird, um in Aufschlüssen Vergleichsdaten für dasselbe Ablagerungsmilieu in tief versenkten, nicht direkt zugänglichen Schichten zu erhalten (z. B. BRYANT & FLINT 1993, MIALL & TYLER 1991). In den letzten Jahren findet dieser Ansatz auch zunehmend Interesse in der Hydrogeologie, die zur Vorhersage von fluid-flow Eigenschaften und für numerische Simulationen präzise Angaben über Heterogenitäten und Verteilung der Porosität und Permeabilität benötigt (z. B. FRASER & DAVIS 1998, KOLTERMANN & GORELIK 1996). Die Poroperm-Eigenschaften lassen sich auf Grund des Verständnisses der Ablagerungsprozesse und durch Charakterisieren der sedimentären Einheiten besser vorhersagen (HORNUNG &

AIGNER 1999). Damit lassen sich sedimentäre und stratigraphische Muster in hydrostratigraphische Einheiten übertragen.
Nach dem Konzept der "Dynamischen Stratigraphie" (AIGNER et. al. 1998) wurden die Abfolgen in verschiedenen Maßstäben untersucht und quantifiziert:

(1) Mesomaßstab: Abgrenzung der Lithofaziestypen nach sedimentologischen Kriterien. Die Lithofaziestypen lassen sich in petrophysikalische Faziesgruppen zusammenfassen, die ähnliche Eigenschaften bezüglich Porosität, Permeabilität und Gamma-Ray Signatur aufweisen. Die Lithofaziestypen entsprechen also nicht gleichzeitig petrophysikalischen "rock-types".
(2) Makromaßstab: Im Aufschluß wurden 9 verschiedene Architekturelemente klassifiziert und kartiert, sowie deren Geometrien (w/t-Raten), deren sedimentären Aufbau (Fazies-Architektur) und deren Poroperm und Gamma-Ray-Eigenschaften quantifiziert. Zur dreidimensionalen Vermessung der Architekturelemente im Raum wurde ein Theodolit eingesetzt. Mit Hilfe des Georadars ließen sich Architekturelemente im Untergrund über die Aufschlußgrenzen hinweg verfolgen. Es zeigten sich stratigraphische und paläogeographische Trends bezüglich ihrem sedimentären Aufbau, ihrer petrophysikalischen Eigenschaften und ihrer Dimensionen/Geometrien. Diese sedimentären Muster lassen sich in hydrostratigraphische Muster übertragen. Zukünftige Fluid-Flow-Simulationen können auf diese Poroperm-Datenbank zurückgreifen. Eine große Auswirkung auf die Strömungsanisotropie haben die erfassten Heterogenitäten in allen Maßstabsebenen (Leckagen, Kommunikation der Sandsteinkörper und Aquiferstockwerksbildung).
(3) Megamaßstab: Die im Aufschluß und durch Subsurface-Kartierungen festgestellten Trends und sedimentären Stapelungsmuster lassen sich überregional weiter verfolgen, wobei meso- (5-15 m mächtig), makro- (10-50 m mächtig) und megaskalige (40-150 m mächtig) Größenordnungen von sedimentären Zyklen unterschieden werden können. Die zyklische Ablagerungsdynamik wird mit Hilfe des "Base-Level"-Konzepts (RAMON & CROSS in press) interpretiert.

Isotopendaten, Merkmale von Paläoböden, die Tonmineralogie und Palynomorphe weisen neben sedimentologischen Daten auf Klimaschwankungen hin als einen potentiellen Steuerungsfaktor dieser sedimentären Zyklen. Aus dem Stacking und den Geometrien der Architekturelemente wurde ein überregionales sedimentologisches und sequenzstratigraphisches Modell für aride kratonische Becken entwickelt, welches auf Klimaschwankungen und daraus resultierend Schwankungen des Playaseespiegels als dominierende Steuerungsfaktoren beruht. Durch die Synthese von Sequenzstratigraphie und Petrophysik lassen sich nun für künftige Fluid-Flow-Simulationen bis zu einem gewissen Grad Vorhersagen der Reservoir- und Aquifereigenschaften machen.

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Metal enrichment in a Mn-rich layer above a „ghost" sapropel S-2, eastern Mediterranean

HÜBNER, A. & HALBACH, P.

Department of Economic and Environmental Geology, Free University of Berlin, Malteserstr. 74-100, Haus B, D-12249 Berlin, Germany, ahb@zedat.fu-berlin.de

A thin dark-brown layer containing unusually high Mn contents of about 4 wt.% was observed in sediment core 6SL taken during METEOR cruise M40/4 in the vicinity of the Urania Basin, eastern Mediterranean (Fig. 1). The core contains dominantly hemipelagic marls with $CaCO_3$ contents about 30-40 wt.%. These sediments were deposited under oxic bottom water conditions, whereas short term anoxic bottom water conditions led to the deposition of dark, sharply defined C_{org}-rich layers. KIDD et al. (1978) defined such layers with thickness >1cm and C_{org} contents >2 wt.% as sapropels; layers with similar thickness, but C_{org} contents between 0.5-2 wt.% were termed sapropelic. Sapropels are known to occur as discrete dark-green to black layers in the sediment column in the whole Mediterranean, and are especially present in the eastern Mediterranean. The conditions leading to sapropel formation are still disputed, but bottom water anoxia, increased surface water productivity and different hydrodynamics in the Mediterranean basin are believed to be the main factors controlling sapropel deposition (for a recent review see e.g. EMEIS & SAKAMOTO 1998). In most cores from the eastern Mediterranean, the sapropel sequence is not complete due to sediment redeposition and/or postsedimentary alteration. The latter process includes diffusion of bottom water oxygen into the sediment column after sapropel deposition ceases. The complete oxidation (burn-down) of a sapropel layer leads to the loss of its dark colour and thus so-called "ghost" sapropels are easily overlooked in sediment sections.
Barium concentrations in core 6SL were used to identify a completely burned-down sapropel of about 3 cm thickness directly below the Mn-rich layer (Fig. 2), and stratigraphic information for core 6SL proves the rare presence of the enigmatic S-2 sapropel. This sapropel was described only once to be present in two cores from the eastern Mediterranean (VERGNAUD-GRAZZINI et al. 1977) and was never addressed since then.
Mn-enrichments above sapropel layers are well known from many cores of the Mediterranean Sea (e.g. MURAT & GOT 1987, ANASTASAKIS & STANLEY 1986), and sometimes a double peak of Mn was observed (e.g. PRUYSERS et al. 1993). The latter authors suggested that the upper Mn peak formed by an upwards-retreating oxidation front. This view was challenged by HIGGS et al. (1994), THOMSON et al. (1995) and VAN SANTVOORT et al. (1996), who postulated the lower Mn peak still being formed by early diagenetic processes, whereas the upper one was produced by precipitation of high amounts of watercolumn Mn^{2+} from fully anoxic bottom waters at the end of sapropel formation, when the water column was reventilated by thermohaline circulation (HIGGS et al. 1994). In contrast of the conclusions of PRUYSERS et al. (1993) the hypothesis of the upper peak being a hydrogenetic (primary) signal is here accepted. Therefore, in accordance with the Ba profile, the Mn-rich layer above "ghost" sapropel S-2 was formed by hydrogenetic precipitation at the time of bottom water reventilation, and thus indicates the original top boundary of the former sapropel. This view is substantiated by trace element geochemistry of the Mn-rich layer. Using ferromanganese crusts as an analogue, high Co contents in the Mn-rich layer and ratios of Co to Cu, Ni and Zn, resp., well above 1:1 suggest a hydrogenetic origin of the Mn phases. In light of recent indications of water column anoxia up to the photic zone during times of sapropel deposition (BOSCH et al.