

to the bedding of the two sampled limbs. The bulk susceptibility reaches its highest values in the samples observed. A general increase of the degree of rotation (PUEYO et al. 2002) towards the south can be observed. Within the Northern Calcareous Alps (NCA), some sites reveal weakly deformed magnetic fabrics with very low susceptibility values and the directions of k_1 vary locally. Oblate as well as prolate magnetic fabrics are present. Three main trends in the in-situ orientation of k_1 can be distinguished: (1) North or South direction, (2) NE or SW direction and (3) NW or SE direction. In most cases, k_3 scatter around the poles of the bedding planes, but in few sites k_3 is aligned near the bedding plane which indicates a stronger tectonic overprint on the fabrics. Tirolitic and Juvavic units display clockwise rotation ranging between 30 and more than 100° (PUEYO et al. 2002), which was assigned to block rotation.

The new AMS data will be presented and correlated to the young tectonic history of the Eastern Alps. A quantitative correlation of AMS and strain data is beyond the scope of this study.

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Facies and stratigraphy of the early and middle Burdigalian North Alpine Foreland Basin (Hall Fm., Eggenburgian)

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The North Alpine Foreland Basin (NAFB) comprises one of the main Oligocene-Early Miocene sedimentation areas of the vanished Central Paratethys Sea and contains important source and reservoir rocks. Currently, the Rohöl-Aufsuchungs AG (RAG) is facing new ventures of oil and gas exploration in the heavily tectonised southern NAFB comprising the Foreland, the Imbricated and the Overthrust Molasse. To assure efficient exploration, a project co-funded by RAG and the Commission for the Paleontological and Stratigraphical Research of Austria (Austrian Academy of Science) intends to provide new insights in the paleoceanographic setting of the NAFB. New data for an integrated analysis (micropaleontology;

foraminifers, calcareous nannoplankton, dinoflagellates; geochemistry: TOC, S, carbonate content, stable isotopes; geophysical logs; seismic images) come from three wells along a N-S-transect spanning late Oligocene - Early Miocene.

In a first step a depositional model for the Hall Fm. (Eggenburgian, early-middle Burdigalian) has been developed. For the northernmost drill-site results show a depositional environment mainly controlled by channel deposition during early Burdigalian. Later the setting changes towards an upper bathyal environment temporary influenced by a prograding delta from the southern coastline. In the South, a calm deep-water setting with elevated bio-productivity persisted throughout most of the Eggenburgian. Only for the uppermost part of the succession a slight shallowing is documented.

In a next step, the successful integrative approach will be applied to the Upper Puchkirchen Formation (Egerian, Aquitanian).

Oceanographic trigger mechanisms for the formation of an Early Miocene (Aquitanian) Konservat-Lagerstätte in the Central Paratethys Sea

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The section Pucking in the North Alpine Foreland Basin of Upper Austria represents an exceptional Early Aquitanian *Konservat-Lagerstätte* with well-preserved vertebrate and invertebrate fossil assemblages. The finely laminated sediments of the Ebelsberg Formation were deposited along the northern shelf of the Central Paratethys Sea. Micropaleontological (foraminifers, dinoflagellates) and geochemical (organic carbon, sulfur, carbonate content, biomarker, stable isotopes) proxies indicate intense upwelling activity. In addition, episodically increased coastal runoff provided large amounts of nutrients stimulating primary productivity. All evidence suggests deposition within dysoxic-anoxic bottom waters of an oxygen minimum zone along the outer shelf and upper slope. Fossil assemblages show specific planktic and nektonic associations in distinct intervals of the section. Various mechanisms are considered to explain their origin: (1) Blooms of pteropods and calcareous nannoplankton reflect short-term peaks in primary productivity. Increased coastal runoff and/or intensified upwelling activity are considered as trigger mechanisms for providing the nutrients. (2) Allochthonous associations of the cephalopod *Aturia* with brown algae suggest a two-fold transport mechanism: shells of the offshore-living cephalopods were transported post

mortem to the coast by surface currents and/or wind currents. Episodic flooding events and storms mixed the accumulated shells with the algae and moved them offshore. The latter process also seems to apply to several pipefish accumulations observed in the section. (3) Multi-species vertebrate accumulations of fish and dolphins are considered parautochthonous as their habitat is in good agreement with the reconstructed paleoenvironment. (4) Benthic macrofauna is scarce and of low diversity. It mainly consists of bivalves adapted to dysoxic environments and is thus interpreted to be autochthonous.

Tracing Central Paratethys evolution in the Early Miocene North Alpine Foreland Basin: The geochemical approach

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Geochemical proxies have become a widely used tool to understand and reconstruct key-variables of past marine environments like primary productivity, water-column stratification or paleoclimate. Recently, successful efforts have been made to use various geochemical proxies for the paleoenvironmental analysis of the Oligocene - Early Miocene Central Paratethys in the North Alpine Foreland Basin (NAFB; e.g., SCHULZ et al. 2005, GRUNERT et al. 2010). Several ongoing projects initiated by the Commission for the Paleontological and Stratigraphical Research of Austria (Austrian Academy of Science), the Rohöl-Aufsuchungs AG (RAG) and the University of Leoben are focusing on the Early Miocene of the Central Paratethys. The data obtained from these studies represent different scales of temporal resolution:

- (1) High-resolution analysis of biomarkers and bulk stable isotopes ($\delta^{13}\text{C}$, $\delta^{18}\text{O}$, $\delta^{34}\text{S}$) from finely laminated marls of the Ebelsberg Formation helped to identify a highly productive upwelling site along the northern shelf of the NAFB during early Aquitanian/late Egerian (GRUNERT et al. 2010). The studied 8 cm-thick section, bearing a huge fossil sunfish, spans only a few hundred years. Providing information about input of plant material from the hinterland, bottom water oxygenation and blooms of phytoplankton it was possible to develop a scenario for the exceptional preservation and accumulation of vertebrate and invertebrate fossils.
- (2) On a time-scale of c. 20-100 ka, bulk stable isotopes ($\delta^{13}\text{C}$, $\delta^{18}\text{O}$) in combination with Rock Eval pyrolysis, contents of sulphur, organic carbon and carbonate significantly contribute to the understanding the long-

term evolution of the Central Paratethys from Aquitanian - middle Burdigalian (late Egerian - middle Ottnangian). Based on sedimentary successions from two drill-sites in the NAFB, the data from the Puchkirchen and Hall Fms. and the Innviertel Group provide insights into a highly dynamic environment: Phases of increased productivity and changes in paleoclimate can be traced and trends be compared to the local and global record.

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2D Becken/Kohlenwasserstoffsystem Modellierung der westlichen Molassezone Österreichs

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Das alpine Vorlandbecken (Molasse) erstreckt sich entlang des Alpennordrandes von Genf bis Wien. Das Untersuchungsgebiet liegt in Oberösterreich und Salzburg. Als Datengrundlage für die Beckengeometrie dienen von der RAG zur Verfügung gestellte Horizonte aus Kurzprofilen von Bohrungen, in Verbindung mit 2D Seismikinterpretationen aus vorhandener Literatur.

Die Kalibration der Entwicklung des Beckens (dessen Geometrie durch mehraktige Bruchtektonik und Überschiebungsszenarien charakterisiert ist) erfolgt mithilfe von temperatursensitiven Parametern (organische und anorganische), wie zum Beispiel Vitrinitreflexion, Formations-temperaturen, Tmax-Werten und Biomarkerdaten. Diese geben sowohl Aufschluss über rezente Formationstemperaturen im Untergrund als auch über Paläo-temperaturen. Mit dem damit modellierten Temperaturfeld über die Zeit lässt sich schließlich die Beckenentwicklung in Form von Paläosektionen rekonstruieren. Definierte Randbedingungen, wie Paläowassertiefe, „heat flow“ Szenarien oder „sediment-water-interface“ Temperaturen dienen dabei als Werkzeuge. Eine erste Abschätzung von Erosionsmächtigkeiten erfolgt anhand von Inkohlungs-sprünge in der Vitrinitreflexionskurve. Untersuchungen an Sonic logs zeigen, dass sich diese gut zur Abschätzung von Mächtigkeiten erodierter Sedimente eignen. Dabei werden Laufzeiten von Schichten gleicher Lithologie in verschiedenen Bereichen des Beckens miteinander verglichen.

Zuletzt werden den Schichten im Untergrund aufgrund von Bohrkernuntersuchungen verschiedene Faziesbereiche