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during this important stage of their evolution.

similar to Purbeckian sediments of NW Europe.

## LATE APTIAN AND EARLY ALBIAN REGIONAL EMERSION PHASE IN ISTRIA, CROATIA

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Istrian part of the Adriatic carbonate platform emerged in the Middle/Late Aptian for the second time and was exposed for 11-19 MY. Exposure related features, which mark type 1 sequence boundary, are represented by greenish-grey clays, marls and lime breccias. Mineralogical, micromorphological and geochemical analysis were performed on clay layers, ranging in thickness from several centimetres up to 1 meter, and the insoluble residues of limestones situated immediately below clay layers.

The main mineral components of clays are illitic material and illite/smectite mixed layer minerals. Occasionally, pyrite, gypsum and chlorite are present. In contrast, insoluble residue is dominated by smectite and illitic material, and occasionally kaolinite. The clay mineral distribution of one investigated profile shows a clear trend indicating the influence of both pedogenic and diagenetic processes. Micromorphological data support consideration of pedogenetic alteration. Distribution of vanadium, uranium, molybdenum and REE, as colour of clay and presence of abundance of pyrite framboids indicate anoxic environment. The current investigation should give answers to provenance of the material from which these clays are formed.

We consider that the clays are remnants of seasonally marshy soils to permanently waterlogged soil, which formed from the erosional remains of surficial soils and sediments, which were accumulated in palaeokarst pits following an oscillating marine transgression that terminated emergence. The Lower Cretaceous shallow-marine deposition sporadically interrupted by periods of emersion are sedimentologically and palaeogeographically very

## OCEAN ANOXIC EVENTS IN THE MID-CRETACEOUS SIMULATED BY 3-D BIOGEOCHEMICAL GENERAL CIRCULATION MODEL

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The mid-Cretaceous is well known by its Ocean Anoxic Event (OAEs). Decreased supply or increased consumption of dissolved O<sub>2</sub> in the deep water is regarded as a cause for the OAEs. But there is little consensus as to the overall forces behind the OAEs. In this study, we conducted a mid-Cretaceous simulation by an OGCM combined with the biogeochemical cycle model to investigate causes of OAEs. The model results show that the thermohaline circulation (THC) oscillated between activity and inactivity. A stable enlargement of an anoxic region is only seen in the proto-Atlantic. This is due to the high export production supported by the elevated concentration of PO<sub>4</sub>, which prevents the supplying of dissolved O<sub>2</sub> to the deep water even under the active THC. Mechanisms that enhance the PO<sub>4</sub> concentration are needed to explain the large temporal and spatial scales that are associated with the OAEs.

## AMMONITES FROM THE BASE OF THE RYAZANIAN STAGE AND BOREAL-TETHYAN CORRELATION

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The Zone *Riasanites rjasanensis* is the lowest Zone of the Ryazanian Stage and Cretaceous System. This Zone is presented in Russian platform by strongly condensed phosphate sandstones by thickness up to 1-2 m with numerous fossils. The *Rjasanensis* Zone is characterized by two groups of ammonites which are quite different in the origin. They are "Boreal" *Craspeditidae* and "Tethyan" *Neocomitidae*. The

