

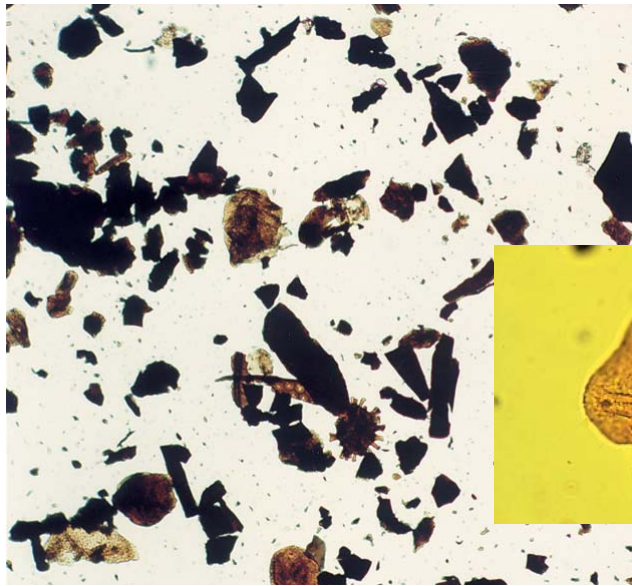


Biostratigraphy in the Deep Subsurface

Biostratigraphy includes the study of palynomorphs (dinoflagellates and sporomorphs) and micropalaeontology (foraminifers/ostracods).

As such they form part of a wide range of biostratigraphic tools available at TNO Built Environment and Geosciences *Geological Survey of the Netherlands*.

Palynofacies type with spores and many dark brown to black macerals indicative of a lake environment. Westphalian core sample from well Kemperkoul-1.



Alisporites pustulatus pollen, Early Westphalian C age, Euramerian floral province.

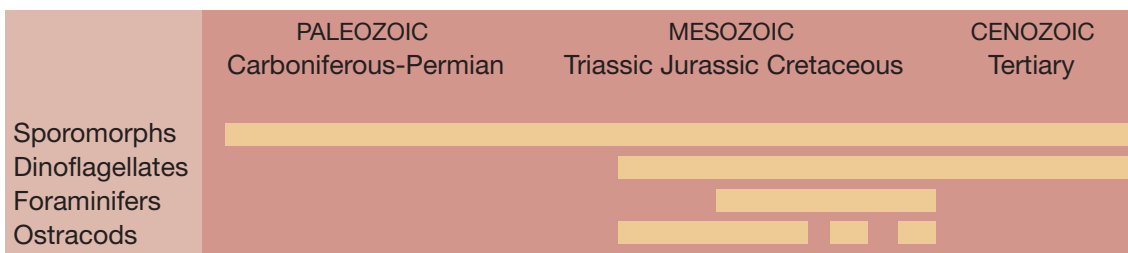


In the marine realm dinoflagellates, ostracods and foraminifers are of outstanding importance. In a terrestrial facies the sporomorphs offer good possibilities for biozonation and comparison. The activities concentrate on dating and correlation, palynofacies interpretations and

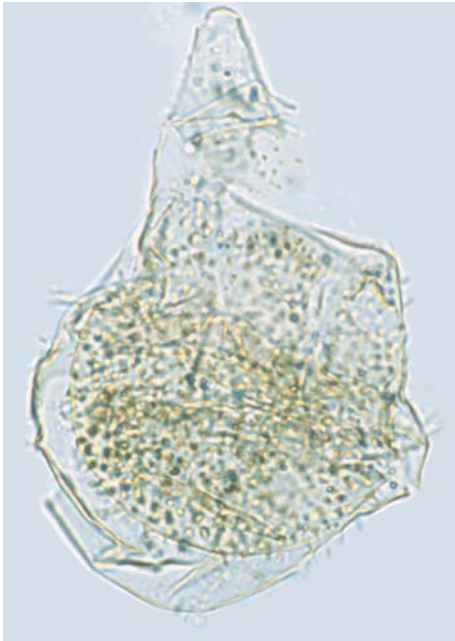
maturation (together with vitrinite reflectance determinations in the Organic Geochemistry Group). During the last decade attention focussed on the Carboniferous in the Netherlands off-shore and the development of sedimentary basins around the Jurassic/ Cretaceous boundary for oil and

gas exploration; more recently Tertiary stratigraphy becomes increasingly emphasized. Moreover, there is a wide expertise in Cretaceous-Lower Tertiary palynostratigraphy of the tropical areas. In palynofacies analysis not only palynomorphs (like spores, pollen and dinoflagellates), but also the complete acid-resistant organic residue after maceration is studied. The residues often contain large amounts of so called palynomacerals which are remnants mainly of botanical origin, they can be subdivided in several categories. The composition of the different palynomorphs and palynomacerals in a sample are indicative of the palaeo-environmental conditions during sedimentation.

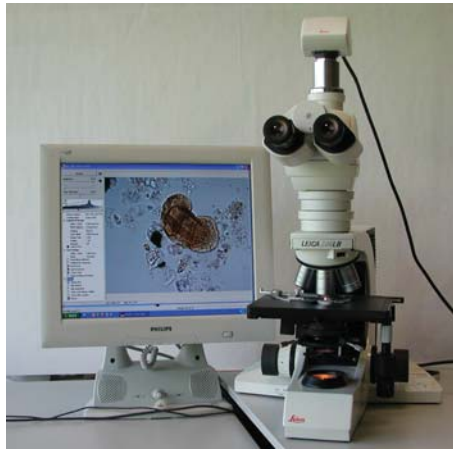
The main clients are the subsurface Mapping and Oil & Gas departments. In addition, numerous studies on a commercial basis were carried out for companies concerned with geological exploration of natural resources.



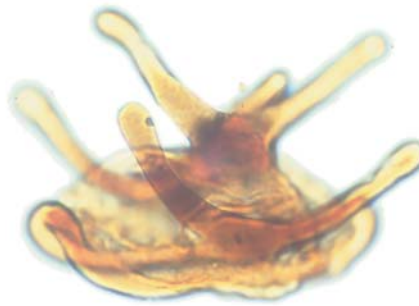
The sources of biostratigraphic information in relation to stratigraphy, as applied in the Department of Geo-Energy



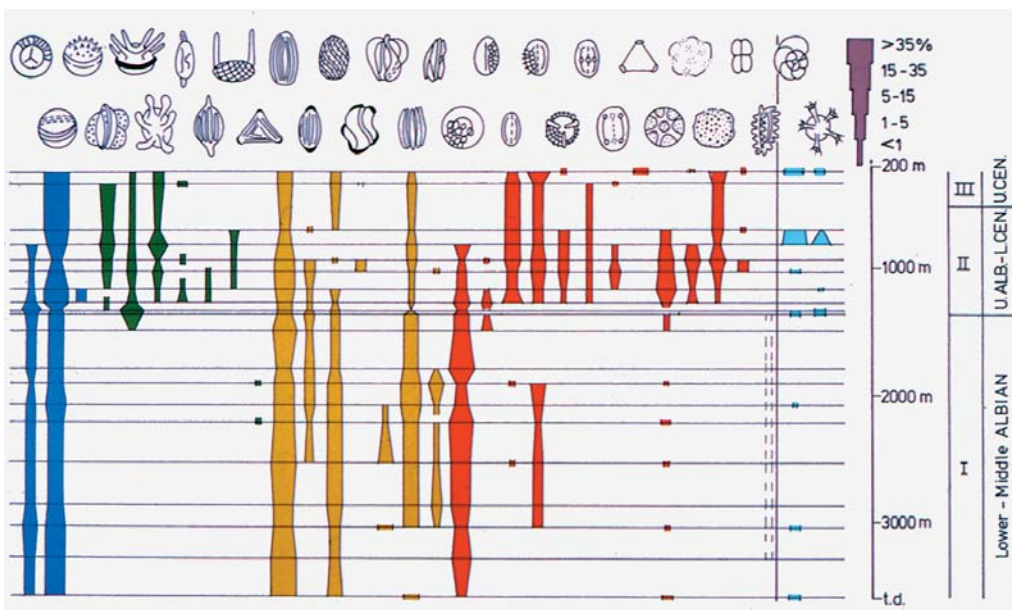
Dingodinium spinosum, a short ranged dinoflagellate around the Jurassic/Cretaceous boundary.



State-of-the-art equipment, including Infra-Red microscopy, is employed in our facilities.



Elaterosporites klazii, a characteristic Middle Albian-Cenomanian sporomorph from the equatorial area.



Pollen diagram of the Brazilian mid-Cretaceous, showing species and groups characteristic for the (palaeo) tropical belt

Geobiology

TNO Built Environment and Geosciences Geological Survey of the Netherlands is the central geoscience centre in the Netherlands for information and research to promote the sustainable management and use of the sub-surface and its natural resources.

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