Top Pre-Permian distribution map & some thematic regional geologic maps of the Netherlands

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Recently an increased effort is made to compile thematic maps within TNO-NITG. These maps are the backbone of numerous petroleum geological evaluations carried out for the Ministry of Economic Affairs. Such evaluations are for example: analysis of the remaining prospectivity of the Netherlands or estimating the future production and gas quality profile from known and yet unknown prospects. These maps are either directly used as a play element map or they serve as a background map for the compilation of other maps to for example confine data to specific regions or impose trends on datasets while contouring.

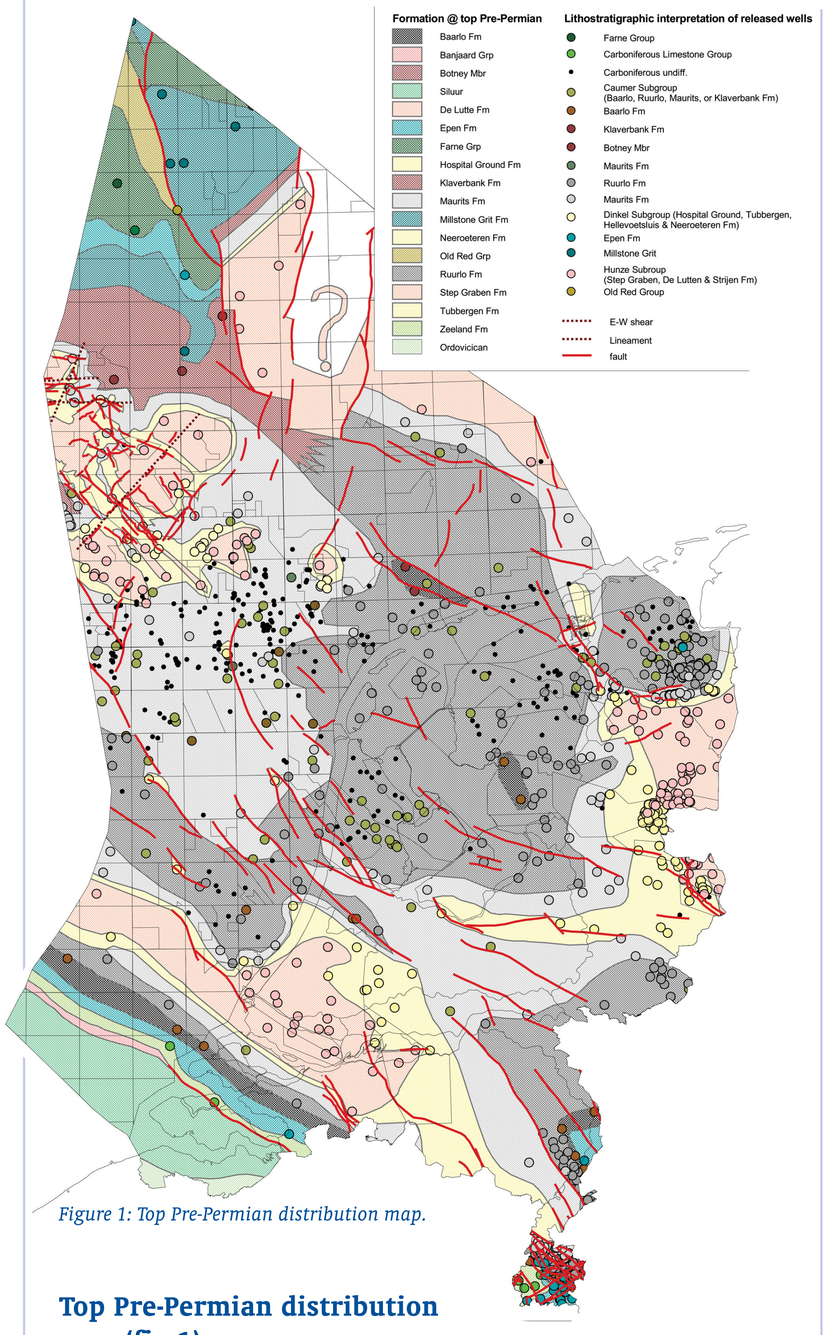

Figure 1: Top Pre-Permian distribution map.

Top Pre-Permian distribution map (fig 1)

This thematic map shows the distribution of the uppermost lithostratigraphic formation of the 'Pre-Permian'. In the largest part of the mapped area it can be defined as the base Rotliegend subcrop map. The map is based on released well and seismic data. All wells penetrating the Carboniferous were interpreted lithostratigraphically aided by (if present) biostratigraphical information. Most of the wells were interpreted down to the detail of Formation or even Member. Others wells could not be interpreted in such detail because of limited Carboniferous penetration.

The reliability of the mapped formation boundaries varies over the mapped area. In the D&E quad the reliability is high (± 500m) because well data was integrated with seismic data (see fig. 2). The subcrop pattern was created using the preserved thickness map of the Carboniferous wedge between base Permian and base Maurits Fm (Schroot et al. 2003). Plotting the top Carboniferous formation on this preserved thickness map it appears that the subcrop from well data corresponds with the colour pattern of the preserved thickness map. It is concluded that the change in colour from, for example, orange to green corresponds to the boundary between the Hospital Ground Fm and the Step Graben Fm. In other areas the reliability of the subcrop pattern is much lower, mainly due to lack of appropriate data. Well data is scarce and seismic surveys are not interpreted down to an intra-Carboniferous horizon. In these area's the accuracy may be as low as ± 30km.

This thematic map is used in for example: assessing the Carboniferous prospectivity within the classic base 'Rotliegend truncation trap' play, the distribution of the Lower Slochteren Sandstone and explaining the gas composition variation.

Further research

The map is compiled in a GIS system and will be updated regularly on basis of newly released well data and interpreted seismic surveys.
Compilers: H. Mijnlieff & M. Geluk

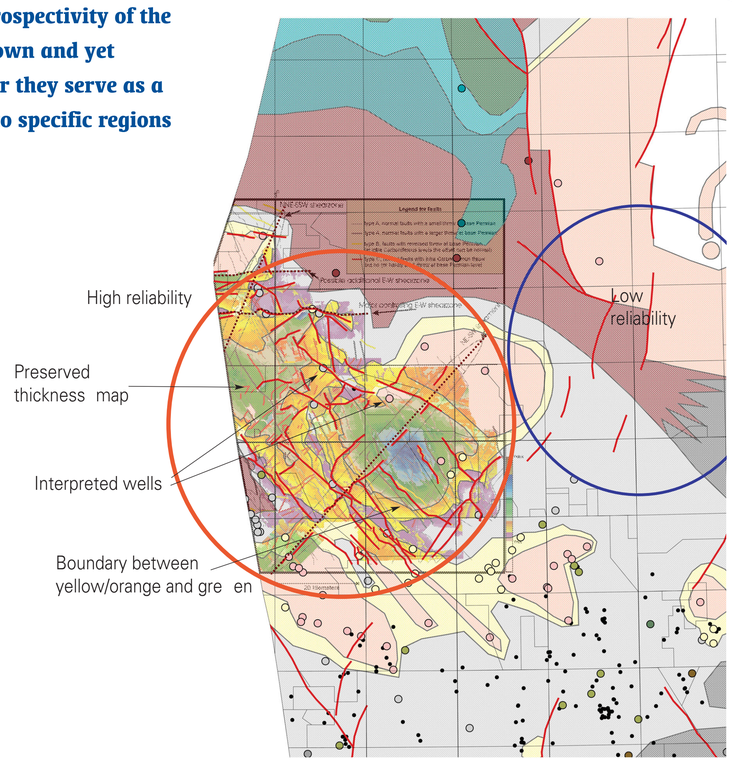

Figure 2: data compilation of the top Pre-Permian map.

Calorific value of Carboniferous and Rotliegend gas (fig 3)

This map is created using the gas composition of gas samples from released wells. Gas samples are, as far as possible, matched with stratigraphic layer from which the sample is taken. From the gas composition the caloric value is calculated and plotted on the map. Then a simple gridding algorithm is applied to inter- and extrapolate the data points.

Further research: effort will be made to: improve the dataset the inter- and extrapolation while honouring trends or data from other maps like the maturity or top Pre-Permian map.
Compiler: H. Mijnlieff

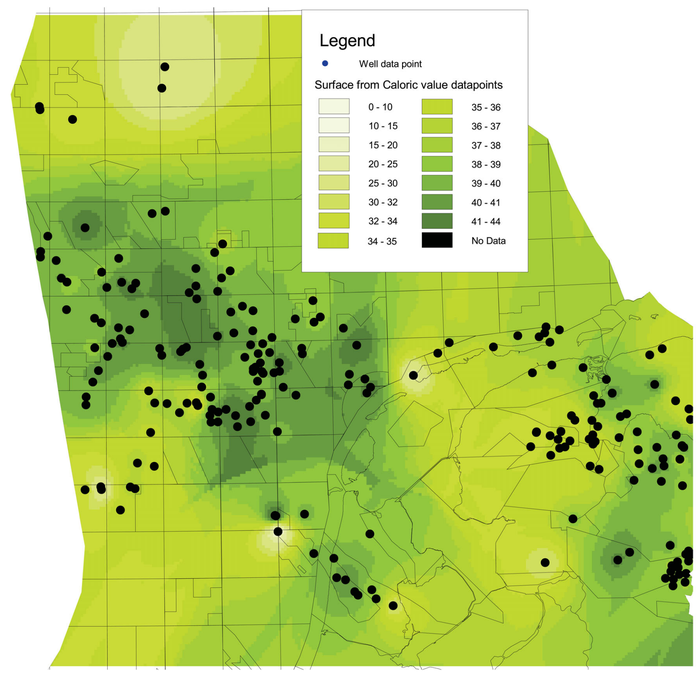

Figure 3: Calorific value of Carboniferous and Rotliegend gases.

The Magnetic anomaly map (fig 4)

This map is compiled using two public domain datasets: KNMI/Rietman 1987 & RUU 1979 (courtesy of J. Verhoef & W. Roest). The datasets were gridded using a simple 'IDW with fixed radius' method. On the map known occurrences of igneous rocks are plotted. In some cases a straight forward correlation between the map and the well data is apparent such as the well known Zuidwal volcano. At the border of blocks F16 and F17 a similar anomaly/volcano is present as evidenced by the occurrence of the Wadden Volcanoclastic Member in well F16-2. The correlation of the Lower Rotliegend Volcanics in the east of Drenthe is less obvious.

This thematic map is used qualitatively to explain for example: high vitrinite reflectance values with a low correlation length and the compilation of play maps and depositional models for Upper Jurassic and Cretaceous strata.
Compiler: W. van Dalfsen & H. Mijnlieff

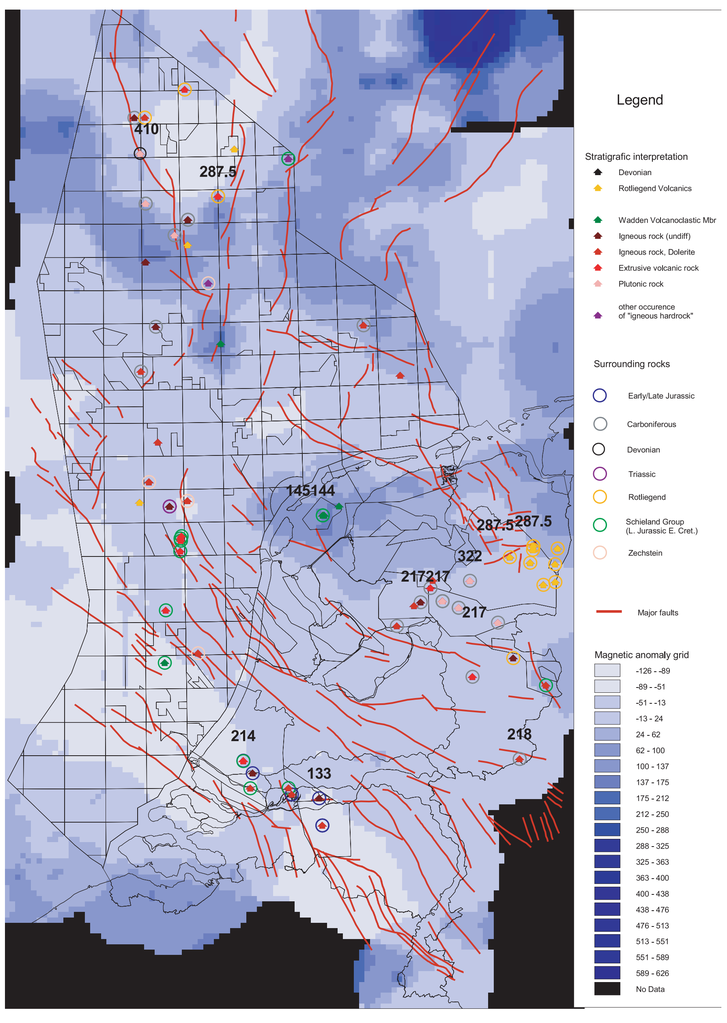

Figure 4: Magnetic anomaly map

The Bouguer anomaly map (fig 5)

This map is compiled using the free-air anomaly from public domain datasets (De Min,1996, 1996, Strang van Hees 1983, 1996, Haagmans et al.1988).

This thematic map can be used for better defining the large scale structural elements or it may serve as a base for unravelling the supposed Dinantian block and basin structure.
Compiler: W. van Dalfsen, H. Mijnlieff

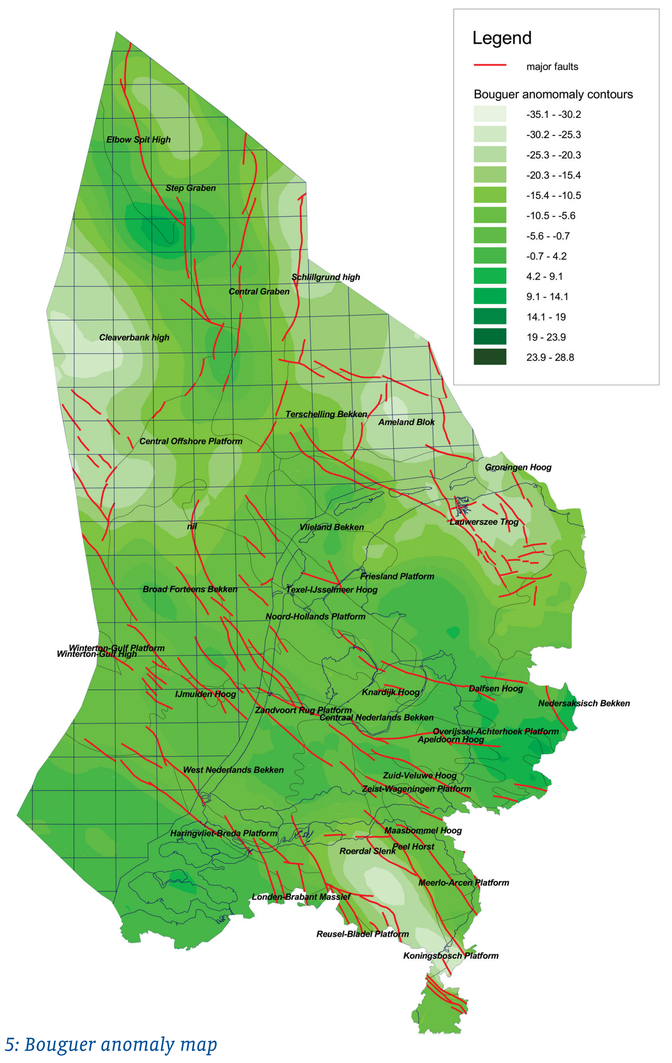

Figure 5: Bouguer anomaly map

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