

H3O: THE LEGACY OF A DECADE OF CROSS-BORDER 3D GEOLOGICAL MODELLING

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The sustainable management and use of natural resources in border regions requires unambiguous geological information from neighbouring countries. However, the available data often lack compatibility and the same level of detail across borders. After stakeholders in the Netherlands and Belgium had expressed a wish to harmonize the (hydro) geological models in the shared border region, in 2012 the first H3O project was initiated. Since then, H3O projects have focused on a series of adjacent border areas, of which the latest (H3O-De Voorkempen) was completed in early 2023.

Aim of the successive Dutch-Belgian H3O projects was/is to produce consistent cross-border, up-to-date, three-dimensional geological and hydrogeological models of the Cenozoic deposits. Existing geological data (boreholes, well logs, seismic data, fault traces, geological maps and models) were inventoried and collected, re-interpreted according to a harmonised lithostratigraphic scheme and fed into 3D modelling workflows.

The deliverables of each project include: (1) a correlation scheme between the relevant Dutch and Belgian/Flemish geological and hydrogeological units; (2) a consistent fault model of the project area (if applicable); (3) geometrically and stratigraphically consistent geological and hydrogeological models of the Cenozoic deposits across the Dutch-Belgian border.

The models represent a state-of-the-art reference for the geological and hydrogeological structure of the project areas and provide a base for joint cross-border subsurface management. It is foreseen to fully integrate the models within the national/regional reference models. Furthermore, the correlations between the Dutch and Belgian/Flemish subsurface units may serve as guidance for future cross-border projects. Plenty of new insights from new correlations and revised interpretations have already catalysed discussions and revisions within both national lithostratigraphic scientific communities.

This presentation will present new results from the project H3O-De Voorkempen, as well as reflect on our experiences, impacts and lessons learnt from a decade of cross-border modelling.

The Dutch-Belgian H3O projects are carried out by a partnership between TNO – Geological Survey of the Netherlands, VITO and the Geological Survey of Belgium. H3O-De Voorkempen received support from the Flemish Bureau for Environment and Spatial Development (VPO), Flanders Environment Agency (VMM), Province of Noord-Brabant and drinking water company Brabant Water. The H3O models are available in the public domain via the online data portals of DOV (Databank Ondergrond Vlaanderen) and DINOloket (Data en Informatie van de Nederlandse Ondergrond).