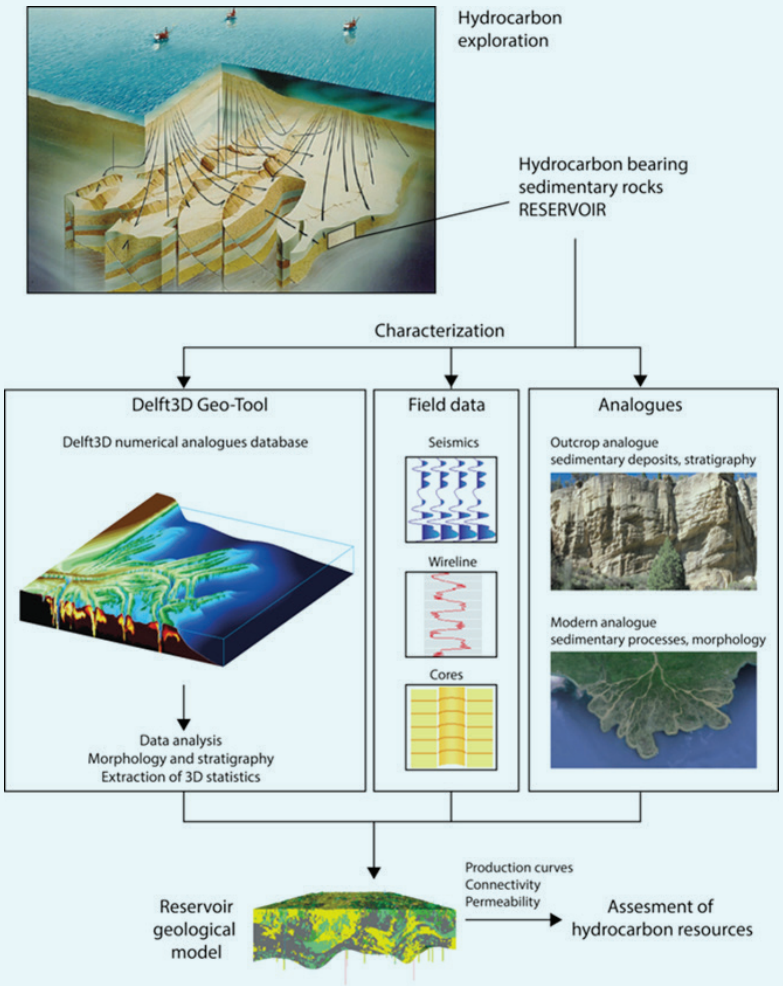
# STRATIGRAPHIC MODELLING WITH THE DELFT3D GEOTOOL

**The characterisation of the subsurface at depth involves dealing with large uncertainties because the acquisition of the available data such as seismics and boreholes is costly and therefore limited. Better information is needed about geological properties such as porosity and permeability, and their spatial variation, in order to use the subsurface more efficiently, for example for hydrocarbon or deep groundwater exploration.**




*Workflow for the assessment of hydrocarbon resources with Delft3D-GeoTool included*

In the course of a sustained research effort, Deltares, Dutch universities and industry partners have developed modelling techniques for building high-resolution stratigraphic models using Delft3D. Delft3D is process-based software developed by Deltares that simulates water, sediment transport and morphological changes in river deltas. These techniques have been used to understand better how river deltas react to changes in forcing parameters such as waves, tides and river discharges, and to different morphology and sediment characteristics. Furthermore, high-resolution morphological and stratigraphic patterns can be used by the industry to improve the characterisation of the variability of geological properties in the subsurface and therefore to reduce uncertainty.

The Delft3D GeoTool (GT) was developed by Deltares and Delft University of Technology in close collaboration with Statoil with the aim of allowing non-experts to use Delft3D and extract relevant data from the simulated models.

A new web-based user interface allows the design and control of individual simulations or scenarios, the export of data to standard industry software, and the calculation of aggregated properties such as channel dimensions and grain-size distribution. The simulations, which are run in cloud computing facilities, are stored in a central database with managed access and can be searched, viewed and exported by other Delft3D GT users.

The database will be filled with simulation results and so data mining will become increasingly useful and effective. The full spatial and temporal data coverage and the possibility of running multiple realisations with controlled forcing parameters such as river, tides, waves, and basin geometries will facilitate the assessment of stratigraphic variability and geological heterogeneity in settings where data are limited.

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**Further reading**:
https://www.deltares.nl/en/news/improving-the-assessment-of-potential-of-buried-oil-and-gas-reservoirs/