

# Plate Reconstructions

## Palaeogeography and Palaeoenvironment

Plate models developed by GeoArctic more accurately reconstruct the palaeogeography of the plate margins over geological time. Our specialized plate reconstruction methods have been successfully used for regional studies in oil and gas exploration since 1996.

**The deformable plate model provides valuable information on:**

**Reservoir and source rocks:**

- Geometry of the receiving basin
- Sediment transport system
- Sediment provenance area

**Structural development and thermal maturity:**

- Rate of extension / tectonic subsidence
- Volcanism (mantle plume & magmatic underplating)



### Deformable Plates

Deformable plate modeling software developed by GeoArctic represents a major advance over the rigid plate models, removing the common problems of plate overlap and under-fit using a geographic information system. The primary limitation of available plate modeling software is that they implement rigid plate models that move plates around a pole of rotation, while ignoring the compression and extension required by deformable plate models. The deformable plate model enables us to compare the plate reconstruction model with observed beta factors in order to fine-tune the plate model.

### Paleogeography & Palaeoenvironment

GeoArctic's proprietary plate tectonic modeling tools allow all available regional geological and geophysical data to be used to build a detailed structural and palaeogeographic history of a plate margin. We create Beta factor maps for both divergent and convergent plate margins for major sequence time-slices and use these maps as input to restore the basin geometry and geophysical, structural and palaeogeographic data to the time of deposition. The restored data are then rotated around the Euler pole for the plate margin to their original geographic location for any period in the geological past, with the common problems of overlap and under-fit now removed. The ability to model deformable plates provides us with information on the structural development of a basin, the depositional setting and provenance of reservoir rocks, source rock distribution, basin connectivity, palaeo-climate and

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