Fluvial Reservoir Connectivity and Hetrogeneity

Publieke samenvatting / Public summary

Aanleiding

Stratigraphic correlation concepts are based on knowledge of external and internal controls on deposition. External control by cyclic climate change on fluvial systems has been used for correlations starting two decades ago [De Jong et al. 2006; 2007; Yang & Baumfalk, 1994]. However, the fundamental concept behind orbital forcing of fluvial sedimentation has not been elaborated, while such understanding brings a huge now unused potential for improved prediction of lateral and vertical occurrence and character of fluvial sandbodies [Abels et al. 2013; 2016].

Doelstelling

FRESCO develops an innovative predictive stratigraphic modelling methodology (PSMM) of low N/G fluvial architecture using field data validated with stratigraphic forward modeling scenarios. The PSMM predicts sandstone body distribution and connectivity to be applied on North Sea Basin successions.

Korte omschrijving

The unique aspect of this proposal is the focus on low N/G fluvial reservoirs using field data validated by stratigraphic forward modelling scenarios. The FRESCO project has four components: 1. Field database construction to document 3D fluvial sandstone body and floodplain architecture within high-resolution age and paleoclimate constraints; 2. Concept development using stratigraphic forward modelling scenarios of 3D fluvial sandstone body and floodplain architecture to develop a predictive stratigraphic modelling methodology (PSMM) of

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Publicaties en materialen / Publications and attachments

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sandstone body connectivity; 3. Forward modeling of petrophysical responses (gamma ray, density) of behind-outcrop borehole data for translation of PSMM to subsurface use; 4. Development of an optimized workflow to apply the predictive stratigraphic modelling methodology to subsurface cases. Innovation takes place in the development of new stratigraphic concepts of the external and internal controls on the building of fluvial architecture (TRL1). Applications take place where these models will ultimally lead to direct implementation by industry in predicting fluvial stratigraphy in the Netherlands' subsurface (TRL2 to TRL4).

Resultaat

The deliverables of FRESCO are: 1. Improved predictive fluvial stratigraphic modelling concept as a function of both external (allogenic) and internal (autogenic) depositional controls; 2. Database of digital outcrops and related interpreted fence panels of fluvial architecture within palaeoclimatic and chronostratigraphic frames, including petrophysical modelling of the panels; 3. Forward stratigraphic model scenarios of external cyclic and internal dynamics in fluvial strata, sensitivity analyses including those specifically targeted for cases such as base-level changes; 4. Hands-on manual of the database explaining the data, interpretation and application; 5. Optimized workflow (TRL4) for industry application in consultation with the FRESCO sponsors.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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